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OF THE

UNIVERSITY OF MICHIGAN

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TRANSACTIONS

OF THE

Clinical Society of the University of Michigan

Stated Meeting, October 11, 1916

The President, CARL D. CAMP, M.D., in the Chair
Reported by REUBEN PETERSON, M.D., Secretary

DEMONSTRATION OF A CASE OF POLYSEROSITIS.

NELLIS B. FOSTER, M.D.
(From the Clinic of Internal Medicine, University Hospital, Ann Arbor, Michigan).

The patient represents a condition or a group of conditions which is very interesting in internal medicine because I don't believe we understand them very well. He came into the Clinic the latter part of August or early September complaining of those symptoms that would be due to an accumulation of fluid in the pleural cavities. He had shortness of breath, progressive weakness and some cyanosis. On examination at that time there was edema of the extremities and a good deal of fluid in one chest, a little fluid in his abdomen and some fluid in the other chest. For diagnostic purposes and also for the relief of the patient, fluid was removed from the right chest. The fluid at that time was a typical pleural effusion, the fluid being clear and not particularly remarkable in its cellular constituents. At a later period his abdomen was tapped and chyliform fluid was recovered. After tapping the abdomen the fluid rather rapidly accumulated in the abdomen and both chests and these in turn were tapped. All of them now contain chyliform fluid.

So we have a condition which we have watched develop under our eyes. The examination in all of the particulars is relatively negative. He has no indication of cardiac disease, or renal disease. I mention these diseases particularly because both are associated with peculiar forms of inflammation of the serous surfaces. There isn't a great deal to see in the man's condition. His color does not come out particularly well in this light. He has a pink cyanosis in the daylight. There is a good hemoglobin color but there is some cyanosis. The fluid last taken from the chest measured 1,400 cubic centimeters. The amount taken from the abdomen was much greater. One can still very quickly decide that there is plenty of fluid in the chest. He has marked edema of the extremities.

The condition in short is that which is best described as polyserositis. Polyserositis so far as its etiologic factors are known is dependent in a great majority of cases upon a low grade tuberculous infection. The differentiation has to be made so far as the etiology goes between tuberculosis, typhoid and chronic colon infections. Those are the only known etiologic factors. Some cases have been attributed to influenza, but it is now believed to be a secondary invader. The question arises as to what other conditions can particularly resemble this. At once we come across a group of diseases which are of a great deal of interest, though not profitable to discuss. They have been styled by Curschmann as iced liver, by Pick as pseudocirrhosis with adherent pericardium, by Concato as diffuse inflammation of all serous surfaces. The characteristic of these conditions is that there is an inflammation of the serous surfaces associated primarily with an adherent pericardium. Evidently an adherent pericardium is the starting point of the process. In the same group Kelly of Philadelphia placed some years ago polyserositis. It is probably an infection of low grade virulence.

We have attempted in this man to demonstrate that this is a tuberculous infection. Fluid from the cavities has been injected into guinea pigs and the pigs have lived a sufficient time and have been autopsied but have not shown tuberculosis. So in this case we are dealing with one of the exceptions. I hope somebody will come to my rescue and give me some suggestion

which will make the case clearer. It is an interesting case, rather uncommon, and to everyone rather obscure.

DISCUSSION.

DR. JAMES G. VAN ZWALUWENBURG: This case was early referred to me for the purpose of excluding carcinoma of the gastrointestinal tract. At that time (before this long period had elapsed) I think carcinoma was correctly taken into consideration. The only evidence I found was that of increased fluid in the abdomen.

DR. D. MURRAY COWIE: I should like to ask Dr. Foster what the laboratory examination of the fluid showed. These cases of polyserositis are entirely different from some monoserous effusions which are not infrequently found. In the latter group of cases we may get true chylous fluid in the cavities and cases looking exactly like polyserositis do occur in which true chylous fluid is found, an association, for example, of chylothorax and chylous ascites or of chylous ascites and chylocele due to rupture of the chyle vessels or to injury to the thoracic duct. Such cases, however, are usually confined to the abdomen and scrotum or to the thorax.

The differentiation of these fluids is not difficult. I should like to know if any fat estimation of this fluid was made. In chyliform fluids there may be a certain percentage of fat present. The amount, of course, is not as great as it is in a case of true chylous effusion, and the fat content cannot be influenced by the character of the food fed as it sometimes can be in those effusions due to rupture of a lacteal. The fat in chyliform ascites or serositis cases comes from cell degeneration.

DR. HARRY D. MALEJAN: Was an examination of the blood made as to filaria bancrofti? I understand that in many cases of chyluria, filaria bancrofti are found in the blood at night. We had a case last year in the Surgical Clinic where a man was passing chyle in the urine. Examination showed a normal bladder. Urine coming from both kidneys contained chyle. We were unable to find the organism. I was wondering if these two conditions might not be associated and whether filaria bancrofti might not be a causative factor in these cases of polyorrhomenitis where chyliform fluid is found in the serous cavities.

DR. FOSTER: The question that Dr. Cowie brought up with regard to the character of the fluid may be answered by saying that it is a true chylous fluid in that there is a "bubby coat" on standing. It is turbid but it does clear up on adding ether, so there is a lipoid substance present. The chemical examination of the fluid has not been undertaken.

DR. COWIE: I would like to ask about the blood count.

DR. FOSTER: There was a slight secondary anemia, nothing special in the lymphocyte count, transitionals 9 per cent.

DR. COWIE: It is an interesting point in chylous ascites that you may get a leukemia. The majority of the lymphocytes come through the thoracic duct.

DEMONSTRATION OF A CASE OF PAPULONECROTIC TUBERCULIDES.

JOSEPH A. ELLIOTT, M.D.

(From the Clinic of Dermatology and Syphilology, University Hospital, Ann Arbor, Michigan).

The case which I wish to present before the Society is not primarily one of interest to the dermatologist only, but to the orthopedist, roentgenologist, and the internist as well.

The patient entered the Orthopedic Department complaining of a swollen and painful knee, which had troubled her for the past seven or eight years. An X-ray picture was taken, and from the suggestive findings she was referred to the Department of Dermatology for examination as to the possibility of a luetic infection.

On examination there was found over the upper portion of the thorax, on the arms, back and thigh a few excoriated papules, which on first glance seemed to be of little importance, but on closer inspection it was noted that these lesions were follicular, surrounded by an inflammatory areola, while some showed a typical necrotic center. The lesions also were of various stages of development, from the small follicular lesion to the involuting necrotic papule. Over the arms, chest and back there were numerous small scars with a definite pitting in the center. Some of these scars showed a slight pigmentation around the periphery. Incidentally I may say that the pigmentation varies greatly with the type of individual, being more marked in brunettes. The right knee is swollen, has a slightly thickened capsule, is painful on pressure, and has limited motion. The glandular system is negative. The mucous membranes are clean, reflexes normal, and the Wassermann negative. The chest was examined by the Department of Internal Medicine, which reports slight dullness over the right apex, probably not pathologic.

As to the eruption over the body, one would probably consider at first glance a dermatitis factitia, which the lesions somewhat resemble, and which is not an uncommon finding in women of a nervous temperament. However, on closer inspection of the finer details of the eruption as previously noted, we are left with but one possible diagnosis, that is, a papulonecrotic tuberculide.

The papulonecrotic tuberculide was first noted by Hutchinson in 1879, and was classed along with lupus erythematosus. One year later Boeck presented the first accurate description of the lesions under the name of lupus ery-

thematosus disseminatus. Barthelemy described the condition in 1891 and called it folliclis, which term is still used by many authors. After that time various terms were employed such as acne varioliformis of Bronson, tuberculide of Darier, and papulonecrotic tuberculide of Hallopeau.

The eruption appears on the extremities as follicular papules which soon become pustular, and usually heal spontaneously within a short time, giving rise to small atrophic scars surrounded by a variable amount of pigment. Relapses and recurrences are not infrequent and the patient may not become free of the eruption for a long period of time.

It was thought for a time that these lesions resulted from circulating toxins in the blood, but more recently there has been a growing belief that the lesions contain active organisms. This belief has been substantiated by positive animal inoculations.

DISCUSSION.

DR. UDO J. WILE: Before taking up the discussion of the knee I should like to say just one word with regard to tuberculides and their relation to tuberculosis. The word tuberculide, if used in the same sense as the word syphilide, is a correct name. Unfortunately, however, the early belief that the tuberculides were toxic tuberculoses, or paratuberculoses, related to tuberculosis only through the dissemination of toxins, has led to an unfortunate misunderstanding about them. They are of more than passing interest to all departments of medicine. In the last four years we have been repeatedly able to determine early visceral tuberculoses, otherwise unsuspected, by the demonstration of tuberculides on the extremities. In children the pediatricians have gone much farther than the dermatologists and internists in that they have been able to demonstrate tubercle bacilli in such lesions and the consensus of opinion is that the appearance of tuberculides on the body of a child under one year means a miliary tuberculosis sooner or later.

In the adult it is rare to find serious tuberculosis with the tuberculides. Expressing it otherwise, it is rare in sanatoria where open tuberculosis is treated to find associated tuberculides. As a rule it would seem as though there were some sort of inverse ratio between the degree of visceral involvement and the presence of tuberculides on the skin except, as before mentioned, in the case of infants. We had one case here four years ago of a young female student of the University who entered the Hospital with typical tuberculides of the leg. The first examinations were negative. Subsequently she came down with a typical tuberculosis, the history being that her father and several members of her family had died of it. We have seen many cases of this disease in the Pediatric Department.

DR. JAMES G. VAN ZWALUWENBURG: I will show the lantern slides of these lesions. (Fig. 1.) The radiogram is very well represented here and shows a very peculiar picture. You will notice that on the posterior surface of the external condyle there are two or three small punched out erosions. These are not associated with any marked calcification about the border or any marked periostitis above and they are not associated with any erosion of the joint cartilages on the bearing surfaces. Also the patella is practically normal. There is to be observed, however, a dark area extending all around the joint which represents the capsule, filled with more or less calcareous exudate.

Of course, we understand the limitations of the X-ray and we deprecate attempts to make a specific diagnosis on empirical findings. However, if we attempt to interpret these plates in terms of gross pathology we get into difficulties. Evidently there is here a low grade chronic inflammatory process sharply localized and associated with a calcareous exudate. Of the chronic inflammations there are only two common ones, tuberculosis and syphilis. I have never seen a tuberculous joint of this kind. We know that syphilis will occasionally attack the knee and sometimes the elbow, and present exactly similar findings. It was on such a basis that a diagnosis was made of "old chronic inflammation, probably lues." In face of the dermatologic findings, we still have to consider a dual infection, unless the other clinical factors are overwhelmingly against a luetic infection.

The precise pathology, if this is tuberculosis, is not at all clear because we so seldom see this form of tuberculosis. It scarcely conforms with tuberculous infarct of the heads of the bones in which the infection is almost invariably transmitted to the joint and the remaining articular cartilages suffer more or less severely. It certainly does not agree with the primary synovial tuberculosis of the joint. Of luetic bone lesions Dr. Wile can speak with greater authority than I, but I have always been given to understand and have assumed that these punched out sharply localized areas of erosion of the joints in lues are due to small gummata just beneath the articular surface. I may add that this is not at all the picture of a "Charcot" joint.

DR. NELLIS B. FOSTER: I don't believe I can add anything to the discussion which has not already been brought out. The conception that I had with regard to the pathology as evidenced in this X-ray picture is very much the conception which Dr. Van Zwaluwenburg has stated. I thought that pictures showing localized areas of osteoporosis were a great deal more apt to be lues than tuberculosis. Of course, as we study the two diseases more and more in comparison, it becomes increasingly evident that they are very much alike, particularly in the way that they attack bones, so I don't believe we can take any dogmatic position which would enable us to say from the gross pathology that it was either tuberculosis or lues, unless the lesion is one which is perfectly characteristic, and this is atypical.

DR. UDO J. WILE: I should like to call attention to the very great chronicity, the limitation of motion in this joint and the absolutely negative serologic findings in the case, which, with all due respect to the limitations of the serologic test, is almost positive in osteoporotic joints. The reaction here has been entirely negative.

DR. ELLIOTT: I had hoped that Dr. Washburne would be here to discuss the knee condition, inas-

much as the patient came to his department. The history is certainly against its being a luetic process, inasmuch as it came on gradually. The lameness began eight years ago and has gradually increased. A careful examination of the woman does not show any evidence whatever of lues and the serologic test is negative. From the findings we came to the conclusion that the knee also was a tuberculous process.

A CASE OF SUPPURATIVE OTITIS MEDIA WITH COMPLETE THROMBOSIS OF THE LATERAL SINUS, SUPERIOR PETROSAL SINUS AND THE JUGULAR BULB WITH INVASION OF THE LABYRINTH.

R. BISHOP CANFIELD, M.D.
(From the Clinic of Otolaryngology, University Hospital, Ann Arbor, Michigan).

I wish to present a case of chronic suppurative otitis media in which a complete thrombosis of the lateral sinus, the superior petrosal sinus and the jugular bulb has taken place apparently without symptoms, and in which an invasion of the labyrinth very recently took place.

This patient has had a chronic suppurating ear since infancy almost without symptoms. About six weeks ago he suddenly experienced pain on the affected side which greatly increased, compelling him to take to his bed. Since then he has had dizzy attacks and has vomited. The attacks were not severe until about a week ago when his neck became stiff and a swelling appeared behind the ear. The night before he came under observation he developed a facial paraylsis on the affected side. At that time in the Otologic Clinic, examination showed a partial right sided facial paralysis being more marked in the upper segments, although noticed throughout the entire right side of the face. He had a perceptive deafness which was practically complete. He could not hear a shout. The tests with the tuning forks were conclusive and the examination of the vestibular apparatus showed that it did not react to stimulation. He had a leucocytosis of 19,000, a swelling behind the right ear and a point of extreme tenderness over the emissary vein. He had a slight spontaneous nystagmus of one degree to both sides.

We had then to consider a chronic suppurative otitis media with subperiosteal abscess, possible thrombosis of the sigmoid sinus and an invasion of the labyrinth. The character of the last could not be definitely stated. The deafness might have been toxic, but the failure to elicit any response to the stimulation of the labyrinth was against that diagnosis and in favor of a recent invasion of the labyrinth by the suppurative process in the ear. This was borne out by the attack of dizziness and vomiting. Our clinical diagnosis was chronic suppurative mastoid disease, possibly a sinus thrombosis and a suppurative infection of the labyrinth.

The operative findings included the discovery of a collection of pus under the periosteum, a sinus through the cortex about the level of the antrum, the presence of a foul smelling pus in the mastoid containing some cholesteatome, and the complete thrombosis of the superior petrosal and lateral sinuses. The operation included the performing of a radical mastoid operation, the ablation of the lateral sinus and the superior petrosal sinus as far as the thrombus extended, and the subsequent resection of the jugular vein and the suturing of the upper fragment to the skin. This last procedure was carried out in order that in case the thrombus in the sinus became infected, the lower portion of the sigmoid sinus and the upper fragment of the jugular vein might be irrigated. The operation included also the extensive opening of the labyrinth through the promontory. The labyrinth was filled with easily bleeding granulation tissue. The findings then were characteristic of a labyrinthine disease although pus was not found there, since it never has been seen in this locality.

Since the operation the man is able to close his right eye somewhat better than before. We expect that his facial paralysis in the course of the next six weeks to two months will clear up, probably entirely. The rapid appearance of this facial paralysis made it necessary to consider not only the possibility of the nerve becoming infected from the extension of the process in the mastoid to the nerve sheath and then to the nerve itself, but also to the so-called Bell's palsy which occurs frequently after exposure to cold, and also to the possibility of this being a paralysis due to lues. In order to be sure we delayed operating until the serologic test could be made. The Wassermann on the blood and spinal fluid were both negative, but the spinal fluid showed an increase above the normal of lymphocytes, fifty-six cells per cubic millimeter. The albumin test was positive and the globuline test was plus.

The chief point of interest in this case is the fact that this man had developed a complete thrombosis of two important cranial sinuses without giving any evidence of the condition, that is, there were no symptoms characteristic of sinus thrombosis and examination was quite

negative except for the presence of a tenderness over the emissary vein.

DR. NELLIS B. FOSTER: This man came first into the Medical Clinic and with the history the diagnosis was at once suggested that he had an involvement of his labyrinth due to his old mastoid. There is one symptom that he had when he came to the Hospital which has not been mentioned, that is, an involvement of the superior oblique muscle of his right eye. Is that still present?

DR. CANFIELD: If so, it escaped my notice.

DR. FOSTER: The diagnosis which we made was the same as Dr. Canfield's except that we very much suspected that he had in addition a brain abscess. The diagnosis apparently was wrong, inasmuch as he is getting well from what has been done in an operative way.

DR. CANFIELD: We didn't suspect that he had a brain abscess. He may have one, although he is getting better. Examination of the fundus revealed no swelling of the disc. As a matter of fact, the diagnosis of brain abscess did not occur to us. It may develop later.

Subsequent note:

The patient made a complete recovery with restoration of the function of the seventh nerve.

AN UNUSUAL CASE OF ANORECTAL FISTULA.

CYRENUS G. DARLING, M.D.

(From the Surgical Clinic, University Hospital, Ann Arbor, Michigan).

Mr. M., age 27, entered the Hospital, August 8, 1916, with the following history: The patient had typhoid fever about one and a half years ago from which he fully recovered. Six months ago he noticed a swelling over the upper corner of the right gluteal muscles which became red and tender. A few weeks later this opened in three places without surgical aid and since that time has continued to discharge a thin straw colored fluid containing some flakes of pus. At the same time there was some tenderness over the lower part of the spine and the right thigh could not be flexed upon the body because of a pull of resistance in the region of the buttock. He now recalls that he had some pain in this locality during and immediately following the attack of typhoid and there was pain along the sciatic nerve line; also there was a limp in walking.

A provisional diagnosis of Pott's disease or osteomyelitis was made and further examination advised. Two days after entering the Hospital, the sinus with three openings was injected with bismuth paste and the patient was sent to the X-ray Department for radiographing. The radiographic report is interesting: (Fig. 2). About one inch below the skin, the sinus divides into three paths. One goes directly forward to form a sacculated sinus cavity, which lies posterior to, external and about an inch superior to the trochanter major. It has at least four or five distinct pockets. It is either subcutaneous or lies between the gluteus maximus and medius. Another sinus tract passes medianward to the posterior portion of the right iliac synchondrosis and opposite the second sacral foramen, divides into two branches, one running laterally to an expansion on the posterior surface of the capsule of the hip joint, the other running mesially to join a comparatively large mass of opaque material which apparently is in the rectum.

A second plate was taken with reference to the osseous system of the head of the femur and sacral region. The report says, "No osseous lesion found to account for the sinus."

The lungs and blood were examined in the Department of Internal Medicine with negative results. He was sent home to return in six weeks, reentering the Hospital about the 28th of September. I saw him first at this time and in going carefully over his history to discover any possible infection or point of entrance, he incidentally stated that three years before he had a "boil" near the anal margin which was painful for a time, then ruptured and has given no trouble since. I made a rectal examination and found a slightly thickened point on the posterior part well within the anal margin. Careful inspection of the skin surface did not disclose any opening and it was only when I carefully tested with a probe a suspicious depression in the skin that an opening was found, the probe going into the tissues about two inches. The next day an anesthetic was given, the opening into the bowel readily found and the fistula laid open. I fully expected to demonstrate a possible connection of this cavity with the sinuses by means of a probe, but failed. The history would indicate that infection from the anal abscess had found its way beneath the skin and subcutaneous fascia and remained quiet until the attack of typhoid when it again became active but not sufficient to break through until some time after he had recovered from that infection. I have not yet been able to prove a direct connection between the fistula and the present sinus and abscess, but to me this seems, in the absence of bone lesions, the most plausible theory.

There is one point in rectal examination that is of importance. Any thickening of the margin of the anus as felt between the thumb and the examining finger should be carefully examined

for fistula, as these fistulae which open on the posterior margin may give rise to a number of sinuses extending in various directions.

DISCUSSION.

DR. JAMES G. VAN ZWALUWENBURG: This is the lantern slide of the radiogram of the sinus after injection in the case discussed in Dr. Darling's report. I hope Dr. Darling will pardon me if I correct him in the matter of the chronologic sequence of the X-ray examinations which he has exactly reversed in his report. That is to say, the examination by means of the bismuth paste was made after we had failed to discover anything by ordinary methods.

The course of the opaque material is easily followed virtually as in the written report in the body of the paper.

I think this case presents two remarkable features from a radiographic point of view; first that a sinus should find its way directly through the iliosacral synchrondrosis and second, that it should produce so little evidence of inflammatory reaction in the surrounding bony tissues that it entirely escapes notice until after injection.

DR. HAROLD DE BLOIS BARSS: It might be interesting to state that after Dr. Darling operated for the fistula in ano, a second injection of bismuth paste was made, and two days later an incision was made under local anesthesia and nitrous oxide, laying open this whole sinus tract as far as it could be traced by the bismuth injection. We traced it over the gluteus muscle and found a dense fibrous tract which we excised. Then we traced it down to the sacro-ischial synchondrosis, but were unable to trace it further. We laid this open and excised all the dense granulation tissue which lined the sinus tract, cleaned it as well as we could and packed it with iodoform gauze. Since then the sinus has been healing. It is impossible to say whether this is temporary or whether the sinus will break out later. What relation this sinus has to the buttock condition we cannot say. It is possible that there was at one time a complete connection which has potentially healed, with a chronic infection in the buttock which has maintained a low grade virulence and caused this chronic sinus formation which may heal after this radical surgical procedure.

LANTERN SLIDE DEMONSTRATION AND RADIOGRAPH FINDINGS.

JAMES G. VAN ZWALUWENBURG, M.D.

(From the Department of Roentgenology, University Hospital, Ann Arbor, Michigan).

1. Case of small child who inhaled a wood screw.

2. Case of postpneumonic process in the left lower lung.

3. Case of cavities in the lungs with thin walls and little other evidence of tuberculous process.

4. Case of traumatic pneumothorax.

5. Case of decompression of the skull.

6. Case of devitalized tooth showing that the filling does not go to the apex.

7. Case of porcelain crown with a peg. Canine tooth, showing cavity in which iodoform had been injected.

8. Case of sacralization of the fifth lumbar.

9. Similar case.

10. Exaggerated case of Pott's disease with destruction and scoliosis.

11. Case of rickets.

12. Case of appendectomy with a sinus which refused to heal.

13. Case of pneumothorax.

14. Case of bilateral congenital hip disease.

15. Tuberculosis of the hip joint.

16. Bilateral aplasia of the epiphysis of the head of the femur.

17. Bony ankylosis as a result of tuberculosis of the elbow.

18. Case suspected of having acute infectious arthritis. Shows elevation of the anterior margin of the astragalus—pathognomonic of flat foot.

19. Case of fracture of the transverse processes of the second lumbar vertebra.

20. Case of fracture of the fifth cervical vertebra, also luxation.

21. Case in a child of osteomyelitis with sharply outlined sequestrum in the medullary canal. No evidence of supposed fracture.

22. Osteomyelitis characterized by an extensive periosteal overgrowth suggesting lues.

23. Case of carcinoma of the stomach.

24. A similar case.

25. Case of ulcer with obstruction of the pylorus.

26. Case of hysteria with "something wrong" in the ilium adhesions.

27 and 28. Two cases of appendicitis.

29. Case of peptic ulcer with adhesions. Reported from surgeons that ulcer was healed but adhesions were cause of the trouble.

30. Fragments of a china doll in a child's intestine.

31. Case of a small boy with retention in the stomach and small bowel.

32. Case of three ureters with two pelves to one kidney.

33. Injection of a kidney pelvis showing kinking of the ureter.

Cases 14, 15 and 16 represent three separate and distinct conditions, occurring simultaneous-

ly in both hips in children, which have many points in common, both physically and radiographically. It is rather remarkable that these three cases should have appeared at our laboratory in quick succession.

Case 14 (Fig. 3) is an ordinary picture of congenital dislocation of the hip with hypoplasia of the epiphyses of the head, with changes in the size, shape and direction of the neck and the relative hypoplasia of the shaft of the femora. The acetabulum is also shallow and the rim is poorly formed.

Case 15 (Fig. 4) comes from an older person. The right hip shows considerable destruction of both articular surfaces, most marked in the lower portion of the acetabulum and in the upper portion of the head. On the left side the joint space has almost entirely disappeared with considerable irregularity and disturbance of the bony trabecula while the head seems almost entirely separated from the neck at the epiphyseal line. In all probability this separation is secondary to the joint changes. This picture although not absolutely specific for a tuberculous infection makes this a presumptive diagnosis.

Case 16 (Fig. 5) is a much rarer condition. Here the acetabula are well formed. The shaft and the epiphyses of the great trochanter are quite normal but the epiphyses of the femoral heads are entirely lacking. All this is without evidence of inflammatory reaction. This case represents a not uncommon anomaly in which either one or more than one of the set of ossifications of the long bone may be absent. It is, however, quite unusual to find a bilateral and symmetric absence of a single epiphysis.

Superficially the deformities produced by

Figure 1. Localized erosion along the posterior surface of the condyle of the femur with some calcareous exudate in the capsule. Lues? Tuberculosis?

Figure 2. Radiogram after injection of a sinus with bismuth paste. Opaque material enters at point A over the buttocks, passes forward to point B, where it divides, the outer sinus leading to a large abscess cavity. The internal sinus passed to C directly forward through the ilio-sacral synchrondrosis, divides at D just anterior to the joint; one branch passes laterally to the posterior surface of the hip F, while the internal branch connects with the bowel at point E.

Figure 3. Double congenital dislocation of the hip

Figure 4. Double congenital dislocation of the hip with erosion of the head of the left femur and involvement of both acetabula. Probably the diagnosis is bilateral tuberculosis, pathological dislocation.

Figure 5. Congenital absence of the epiphyses of the head and necks of both femora. Congenital anomaly.

these three lesions are quite similar and the history will not distinguish between congenital dislocation and congenital absence of the head. This diagnosis of bilateral tuberculosis of the hip may be made with considerable certainty from the history and the physical examination. However, the involvement of both hips in one and the same individual is sufficiently rare to deserve some comment.

Case 16 represents a fracture which is seldom suspected and found with surprising frequency by the roentgenographic examination. It consists in the separation of the extremities of the lateral processes of the lumbar vertebrae. This injury is usually the result of a powerful blow directed obliquely from behind and from the side in the upper lumbar region. In this particular instance, the man was struck by the sill of a freight car overtaking him from the rear. We have seen another case resulting from a fall across a piece of timber.

Usually a fracture of the ribs is suspected, because of the pain on breathing and the fixation of the side and it may be accompanied by injury to the kidney with hematuria. Usually the X-ray finding has been considerable of a surprise.

In every instance we have seen, the position of the fragments has been excellent and the only treatment which has been necessary has been rest in bed with a dressing designed to fix the trunk.

TRANSACTIONS

OF THE

Clinical Society of the University of Michigan

Stated Meeting, November 7, 1916

The President, CARL D. CAMP, M.D., in the Chair
Reported by REUBEN PETERSON, M.D., Secretary

(a). A CASE OF A DIABETIC WITH UMBILICAL HERNIA, COMPLETE LACERATION OF THE PERINEUM, AND FISTULOUS OPENINGS IN THE REGION OF THE RIGHT LABIUM.

(b). A CASE ILLUSTRATING THE ADVANTAGES OF THE REMOVAL OF OVARIAN CYSTIC GROWTHS WITHOUT ASPIRATION.

REUBEN PETERSON, M.D.
(From the Obstetric and Gynecologic Clinic, University Hospital, Ann Arbor, Michigan).

(a). *A Case of a Diabetic with Umbilical Hernia, Complete Laceration of the Perineum, and Fistulous Openings in the Region of the Right Labium.*

This patient is 53 years of age and married. The family history is negative. She has always had good health until a short time ago when she began to have pains in her back and hips which she thought were rheumatic. Her menstruation began at the age of 10 and was regular until her marriage at the age of 17. After the birth of her first child she did not flow for ten years and became very fleshy. She passed through the menopause five years ago. Her first two children were stillborn and she was lacerated into the rectum at the first confinement. She had inflammation of the womb at this time for four or five months and has had incontinence of feces ever since.

She comes to the Hospital for a tumor at the navel, an abscess of the right labium and inability to control the bowel movements. Lately her womb has come down so that at times she can see it. About twenty-three years ago, while carrying a child, a small tumor developed at the navel and has gradually grown larger. Six weeks ago an ulcer formed on the top of this tumor, but except for this, there are no other symptoms, not even pain. Last July she developed an abscess on the right side of the external genitals which broke and discharged a lot of foul pus. The discharge has decreased and now is composed of blood with very little pus.

Examination shows the patient to be of large frame and well nourished. The abdomen is negative throughout except for a mass the size of a cocoanut which protrudes through an umbilical opening two inches in diameter. (Fig. 1.) About one-third of the upper surface of the hernia is covered by a skin slough, which is separating at the edges. The mass is soft, dull on percussion and cannot be reduced through the hernial ring.

In the upper and outer side of the right labium majus is a brownish, indurated area, in the center of which are two small fistulous openings discharging a thin purulent, bloody fluid. Another indurated area and another fistulous tract lie between the labium and the crease of the thigh. The cervix prolapses through the vulvar opening when the patient strains, the external os being bathed in fecal matter coming from the anal opening which has been torn through the sphincter and some two inches up the bowel.

The ulceration of the skin about the hernial mass is unusual in my experience. The hernia is not strangulated and there is no particular tension to account for the sloughing. In all probability no bowel is in the protrusion since it is dull on percussion and therefore probably the sac contains adherent omentum. In my opinion, since there is no history of trauma in connection with this hernia, the necrosis is probably due to a general condition, diabetes.

which an examination of the urine showed the patient to be suffering from.

In fact I selected this case tonight not because of the umbilical hernia which is not uncommon, nor on account of the complete rupture of the perineum or prolapse of the uterus, conditions which are too frequently met with in the Clinic, not even for the abscess in the external genitals which is rather uncommon. I report the case not because of these surgical conditions, any one of which demands operation, but to elicit a discussion of whether any operation is justifiable on this patient who is suffering from diabetes. Fortunately we have with us a man who is particularly interested in diabetes, and who is in a position to tell us surgeons when and when not to operate on diabetic patients. So I shall leave the discussion of the diabetic condition to Dr. Foster.

There is a great responsibility resting upon the surgeon in regard to operations upon diabetics and in elective operations such as this patient would have. The internist should be called in wherever possible. The patient has had the umbilical hernia and the ruptured perineum for a long time and really does not come to the Hospital for the relief of these conditions so much as to be cured of the fistulous tracts in the external genitals. Even this latter condition possibly could be endured if there was greater danger to life from operating in an advanced case of diabetes. During the past twenty-five years I have erred by not realizing the dangers of operating upon patients with apparently mild cases of diabetes.

In any case, if Dr. Foster says it is safe to operate I shall try to relieve the patient of the suppurating areas in the external genitals and postpone the operations for the other surgical conditions to a later date.

NOTE. About ten days after the demonstration of this patient before the Society, with Dr. Foster's sanction, under ether the fistulous tracts in the right labium and groin were opened up and a considerable amount of dark, unhealthy granulation tissue removed. The exposed areas were then packed with gauze. Altogether the patient was not under ether more than fifteen minutes.

Fig. 1. Large umbilical omental hernia with areas of skin sloughing, due to a diabetic condition.

The patient did badly from the time of the operation until her death twenty-seven days later. The curetted area never showed any signs of healing. Two weeks after the operation signs of inflammation appeared in the suprapubic fat fold where the skin became brawny, indurated and reddened. The area spread to the flanks where the skin became necrotic in places. Finally the patient became stuporous with the pulse and temperature markedly elevated until death.

Autopsy showed in addition to the labial abscess, extensive inflammation of the abdominal wall even involving the pubic bone.

Inasmuch as death was due to the diabetic condition, Dr. Foster has been asked to append a note of explanation to his discussion of the case.

(b). *A Case Illustrating the Advantages of the Removal of Ovarian Cystic Growths Without Aspiration.*

The second case I wish to report is that of a woman of 49, who comes to the Hospital for an abdominal tumor which she first noticed about a year and a half ago. When first observed it was in the median line and has gradually grown until now she is short of breath and has distress in the epigastrium. At times she has pain and is unable to sleep. During the last few months she has lost twenty pounds and is much weaker than she was a few weeks ago.

Examination shows the patient to be of average build and not emaciated. The abdomen is markedly distended from the pubes to the epigastrium by a growth for the most part cystic, although in places denser portions can be felt. (Fig. 2). The tumor rises almost perpendicular from the pubes, reaches its highest point at the umbilicus and slopes evenly to the ribs and flanks. The diagnosis of a multilocular ovarian cyst is borne out by palpation and percussion and confirmed by the results of vaginal examination.

October 20, 1916, the abdomen was opened by a median incision, 15 inches long, reaching from the pubes to several inches above the umbilicus. A large multilocular cyst of the left ovary was delivered through this long incision, the moderately long and thick pedicle clamped, and the cyst removed without rupture. The other details of the operation need not be gone into. The patient was not shocked by the operation, made an uninterrupted recovery and left the Hospital well. At this time the incision measured only five and three-fourths inches so much had the distended abdominal wall contracted. The tumor weighed twenty-four pounds,

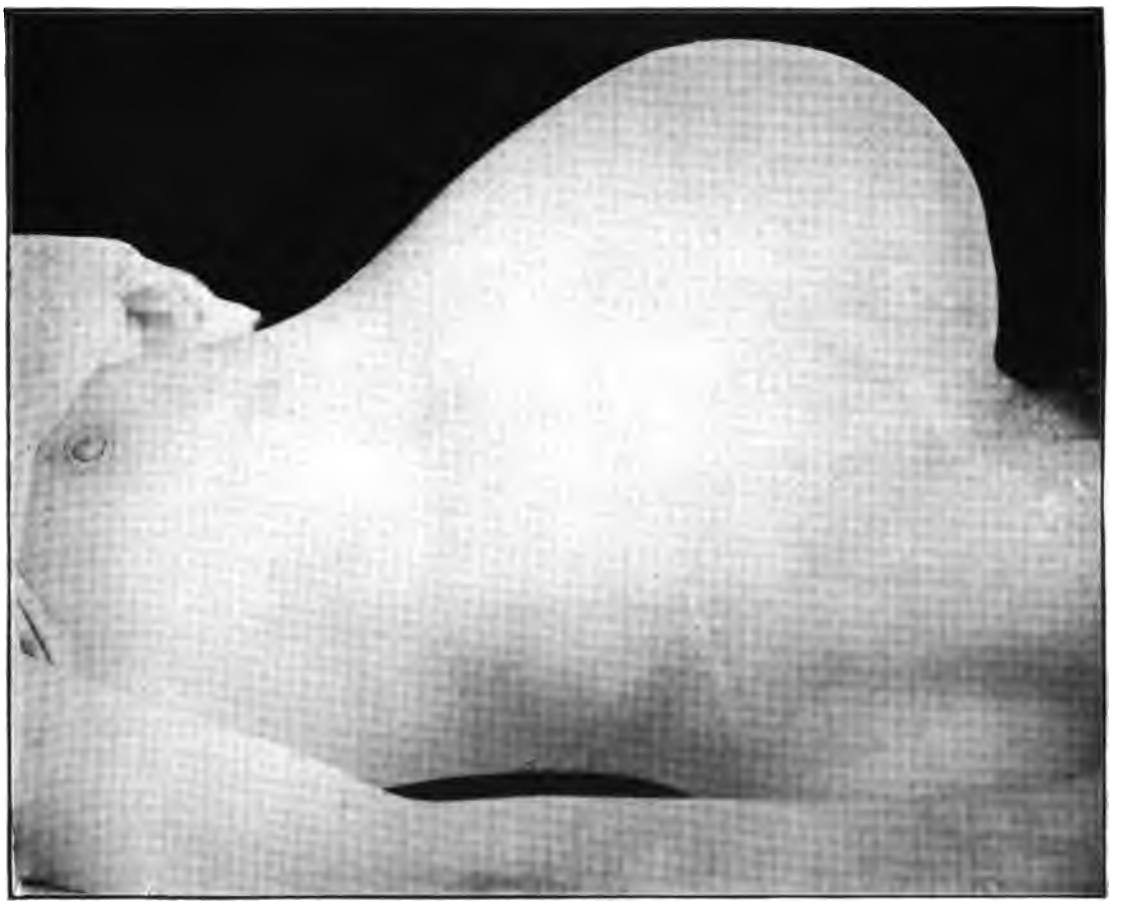

Fig. 2. Large multilocular cystadenoma of the ovary, weighing 24 pounds, removed without aspiration through a long median incision.

was an ordinary multilocular cystadenoma without any signs of malignancy.

I wish particularly to discuss the method of operating adopted in this case; in fact this is the reason for the report. The incision employed was rather a startling one and should not have been used unless something was to be gained by it, since undoubtedly, beyond a certain length, the larger the incision the more is the danger of subsequent hernia. The reason for the long incision employed in this Clinic for the past two or three years for the removal of large ovarian growths is for the purpose of protecting the uncontaminated peritoneum from the contents of the growths, since through the long incisions the cystic growths can be removed intact. We believe that the old method advocated for so many years of a small abdominal incision and aspiration of the contents of the cyst is an unscientific procedure and is a relic of the past when a small incision, because of the dangers of infection, was less dangerous than a large one. It is not true, as stated in the textbooks, that a cyst can, as a rule, be aspirated and the peritoneum be uncontaminated. In 1913, Bland called attention to the reasons for removing ovarian growths intact and these reasons seemed so logical that since that time I have made the incision large enough to remove the growth without aspiration.

If, then, there be a probability of contaminating the peritoneum through aspiration of the cyst contents, we are in duty bound to remove the cyst intact because we can not tell beforehand whether the cyst be malignant or not. Careful microscopic examination of ovarian growths shows that nearly 50 per cent. are malignant. Hence we should be careful not to contaminate the peritoneum with a fluid which may give rise to malignant metastases through transplantation. At least, we ought to use the same, if not extra, precautions here against transplantation that we do in removing a cancerous uterus or a cancerous breast.

It will not always be found possible to remove large cysts intact even with the longest incisions. Thin walled cysts adherent to the abdominal wall and intraabdominal organs may rupture during removal even with the greatest care. However, these are the exceptions, not the rule.

DISCUSSION.

DR. NELLIS B. FOSTER: The case that Dr. Peterson has presented is very interesting from two points of view. Is the glucosuria due to an infection, or is it an infection in a diabetic? There are a few individuals apparently predisposed to develop in consequence of an infection, a spontaneous glucosuria. This is particularly prone to be the case with gynecologic infections; there develops in consequence of some infection of the genital tract, a glucosuria. It is an interesting fact but is of no particular use to us because we cannot differentiate such cases from individuals who are primarily diabetic unless there is a history of diabetes previous to the infection. The only thing that will clear up the case which Dr Peterson has presented is to observe her after she has been operated upon and find out whether she can return to a normal diet without glucosuria. That is one point to be borne in mind. If that is not the case, then she is a diabetic with a surgical condition which should be operated upon. There arises then the question when can an operation be undertaken on a diabetic individual, or what are the conditions which must be fulfilled in order that operation may be conducted safely? Surgeons quite properly fear to operate upon diabetic patients. The reason is that older individuals who have diabetes and develop some condition which is surgical are apt in the first place to develop infections following the operation. They are more prone to infections than ordinary individuals are. When an infection occurs in a wound in a diabetic individual it is very apt to go on to a stage of necrosis which we call gangrene. In the younger individuals an operation is very prone to be the beginning of a severe acidosis if acidosis is not already established and many of these patients die in coma. So we have two dangers, infection and coma in two quite different classes of patients. The reason for the danger of infection is perfectly evident if one stops to think what the diabetic state really is. Sugar appears in his urine on account of an increase of sugar in his blood. On account of the increase of sugar in his blood we have an ideal culture medium. The pyogenic cocci will not grow in cultures without sugar. They grow best in a considerable amount of sugar. The average per cent. of sugar in normal blood is .08 to .15. The mild diabetic has a blood sugar of .18 to .22 and above. Then there is another source of danger that we are apt to overlook. If an individual has a moderate degree of nephritis his kidney becomes less permeable to sugar as well as to other substances. So that you may find now and then a diabetic without any sugar in his urine. I recall very distinctly a case in point which is worth mentioning. A surgeon operated upon a person apparently in fairly good health. The operation was an appendectomy. The wound was not infected apparently but it refused to heal. It was gray and began to slough. The case was in the hospital and I had opportunity to see the patient. On taking a very careful history one learned that some fifteen years before sugar had been detected in the urine for a couple of weeks at a time and then it disappeared. That led us to make an examination for blood sugar. We found that this individual had in spite of a low diet, a blood sugar of .24 per cent., practically double the normal. By suitable diet the blood sugar was brought to normal and the wound healed promptly. Often as soon as the blood sugar crosses the normal line you can see in twenty-four or forty-eight hours a difference in the appearance of the wound.

This patient Dr. Peterson has transferred to us with the question, can the patient be operated upon? Not at the time when she was first seen, surely. How can we render her a safe operative risk? It

is simply a point of reducing the blood sugar until it is near normal and that can be done by diet. She represents a case of mild diabetes. Upon a slight diet restriction the sugar disappeared from the urine and today her blood sugar is .15 per cent. which is the high normal. In three days more she will be a perfectly safe operative risk.

With cases such as this one of Dr. Peterson's there is seldom any difficulty in effecting such control of the diabetes that one can almost guarantee a good surgical result. It is never safe in my opinion, to attempt a surgical operation so long as there is sugar in the urine and it is hazardous when the blood sugar is high even though there may be no glucosuria.

There is one class of surgical complication in mild diabetes which is very difficult to handle. I refer to infections of the cellulitis type. Much depends of course on the virulence of the invading organism but when with a diabetic whose disease has been of a mild type this complication occurs the diabetes seems at once to become severe. I have seen fasting attempted under these circumstances with no effect on the glucosuria and the rapid development of grave acidosis. These patients frequently die in coma. Here the surgical treatment is of primary consideration and the infected area must be opened freely.*

Diabetic patients are liable of course to the same surgical disorders as the rest of us and the question that confronts a surgeon under these circumstances is when can he operate with relative safety and when is the risk prohibitive. I have already said that with any case there is danger so long as there is glucosuria. With younger patients acidosis is even a more serious factor for consideration. The best test, quickly applied, is an estimation of the alkali reserve in the blood. If this can not be done then one must know the amount of ammonia excreted in the urine, which is also a test of the degree of acidosis. If the ammonia is near four grams for twenty-four hours then an operation would almost surely precipitate diabetic coma. With one gram of ammonia there is no prohibitive risk but above two grams a surgeon should operate only in an emergency and a very high degree of skill would be required during the postoperative period to control the acidosis.

Surgeons have a well founded timidity about operations on diabetic patients. A diabetic can usually be treated so that the risk of an operation is not great, but it demands no little study in each case and some knowledge of metabolism; and this preliminary treatment is impossible outside of hospitals equipped with laboratories for precise chemical estimation.

*Note. The patient who was the subject for this discussion died without sugar returning in the urine, and the blood sugar remaining within normal limits. The autopsy revealed that the infected areas were much deeper and more extensive than were indicated during life. Since suppurative areas appeared after the first operation it is presumable that extension occurred, probably from the bone focus into the abdominal muscles. The age and general condition secondary to long standing diabetes of course favored this. With infection so extensive as this was shown to be at the autopsy, recovery would not be expected in a subject of any chronic disease.

A CASE OF TRANSVERSE MYELITIS OF THE CERVICAL REGION OF THE CORD.

ALBERT M. BARRETT, M.D.
(From the Psychiatric Clinic, University Hospital, Ann Arbor, Michigan).

The case is that of a girl 15 years of age who was admitted to the Psychopathic Hospital on September 1, 1916.

She came of a family of unusually bad nervous and mental constitution. Her father and grandfather had both been insane and the mother was of low mental development. There were eight other children in the family, all of whom were regarded as being mentally backward.

As a child, our patient had been sickly and backward in both physical and mental development. Menstruation first appeared at the age of 14, and from that time on she was irritable and complaining. At the age of 15 she had only reached the fourth grade in school. Following the death of her father, family circumstances made it necessary to arrange for the care of the children and on account of the very apparent mental backwardness of our patient she was sent to this institution.

The physical examination showed little that was pathologic. The thyroid was a little enlarged. There was no enlargement of the cervical or inguinal glands. The lungs showed no abnormalities on examination. The heart was not enlarged and the valvular sounds were normal. There were complaints of pain and tenderness in both inguinal regions and on pressure this became increased. There was some tenderness over the roots at the sixth dorsal and first lumbar vertebrae.

Neurologic examination showed keen sensibility to touch, pain and temperature throughout the body. All of the tendon reflexes were normal in their reaction. Aside from fine tremors of the fingers and tongue, the neurologic examination was entirely normal.

The important psychiatric condition present was a low grade of mental development. The Yerkes-Bridges point scale examination showed her to have a mental age of but eight years.

There was little further of interest in the patient aside from occasional complaints in the left iliac region, until Sept. 15 when she complained of headache, epigastric distress, and stiffness of the neck. Constipation was marked, there having been no bowel movements for four days. In the afternoon her temperature rose to 101.4°. On the 16th the temperature, early in the morning, was 99.5° and it continued moderately high during the day, reaching 104°

in the afternoon. Bathing did not reduce the temperature. She complained much of soreness in the neck. The cervical trapezius was in a state of tonic contraction. The head was somewhat retracted and the back stiff. Late in the afternoon it was impossible to flex the neck. The knee jerks could not be obtained. There was no Clonus, Babinski or Kernig's sign. Nowhere was there any muscular paralysis. A lumbar puncture at this time showed increased pressure. The fluid was clear and there were eleven cells per cubic millimeter. The globulin was not increased. The Wassermann reaction was negative. The colloidal gold test of Lange gave a slight change in color in the first four tubes. There was a leucocytosis of the blood of 14,700. She was referred to the Department of Otolaryngology, which reported that there was pharyngitis and septic tonsils, but not enough to warrant the symptoms. On the 18th there was a complaint of a feeling of stiffness in the legs. There was a marked diminution of the power of the muscles of the legs. Babinski reflex could be occasionally obtained but was soon exhausted.

On the 19th there was a general agreement that the condition present was a transverse myelitis of the cervical region, but of undetermined etiology. On this date she was transferred to the Department of Internal Medicine.

Abstracts of the notes made in that department are embodied in the following comments: During the 19th her temperature continued high; during the evening it reached 105°, the pulse was around 120, and the respirations were about 35. Generally, she was clear in her comprehension but somewhat stuporous. The pupils were small, equal, and reacted poorly to light. Extraocular movements were normal. The tongue was dry and protruded straight. She complained of pain in the neck on moving her head. She raised both arms with difficulty. There was flaccid paralysis of the triceps of both arms, and to some extent of the shoulder group. She was insensitive to pain on the inner side of the forearm, but felt the pin clearly on the outer side. Respirations were of the abdominal type. There were signs of an inactive lesion of the left apex. The abdomen was distended. The bladder was filled up to the hypogastrium. The legs were flaccid and there was complete paralysis of the legs and feet. All tendon reflexes of the lower extremities were absent. There was a complete loss of appreciation of pain on the back below the level of the second dorsal spine, and in front, below the level of the distribution of the second dorsal nerve.

Several attempts at lumbar puncture were made. There is no reason to doubt but that the needle entered the canal, but no fluid could be obtained.

There was no improvement in the symptoms during the next two days. On the 22nd the temperature by rectum registered on one occasion 107.5°. The pulse was 170. She complained of slight photophobia.

On the 23rd, there was noticed an increasing cyanosis of the face, hands and trunk. The breathing was entirely abdominal and irregular. Her consciousness was much clouded and there was no response to questions. There was no evidence of swelling on either side of the neck. The right pupil was widely dilated and the left was slightly contracted. Shortly before death this pupil dilated to the size of the right.

Death occurred on the 23rd of October, eight days after the beginning of the acute illness.

An autopsy was held a few hours after death. The examination of the internal organs showed slight adhesions around the region of the left apex. There were also adhesions in the region of the spleen, stomach and liver. Otherwise there was little notable for this discussion.

As the cut into the back was made for the removal of the cord one came into a pocket of pus which flowed in from the left trapezius muscle and was traced upward among the muscles of the neck on the left side but its source was not determined. On opening the canal the pus flowed into the canal and obscured the relations. One noticed in the lower lumbar dorsal region that a considerable portion of the dura was hemorrhagic. Otherwise there were no changes of a gross nature in the dura. As the dura was opened the cord in the cervical region was seen to be larger than normal, so large that it filled the arachnoid space at about the level of the fourth dorsal segment. In the examination of the cord there occurred a small ooze of what probably was softened spinal substance through the membranes.

The brain showed nothing pathologic in the gross. The cord was taken to the laboratory and fixed in formalin and prepared for further technical processes by sectioning. In the first preliminary examination of the cord one found in the regions of the fifth, sixth and seventh cervical segment that the cord was swollen and distinctly softened and on cutting one could see evidences of marked changes and hemorrhage. The microscopic examination of the material has proven of great interest. One

finds that at the region of the fifth and sixth cervical segment there is what might be called a degenerative myelitis. The cord is very much swollen; the myelin has disappeared in large patches from around the fibers of the cord and many of the axis cylinders have gone to pieces. One sees in places small hemorrhages and the differentiation between the gray and white substance of the cord is indistinct. There is a marked proliferation of the neuroglia and marked involvement of the gray substance of the cord by a very severe degenerative process. One sees numerous compound granule cells or epithelioid phagocytes filling the vacuoles left by the absent myelin and around the blood vessels. This condition can be seen for some length through the cord. One sees traces of this through the fifth and sixth cervical segments and almost to the first dorsal segment. In a preparation by Marchi's method you will see in the posterior horns a blackened area in the center which marks the position of the softened part of the cord. The remainder of the cord is rather porous.

The process in its extent is a very complete transverse myelitis. When one examines the segments below the cervical region little is found. There is some hemorrhage in the dorsal region. In the lumbar region there is practically no involvement. There is no meningitis, perhaps an early proliferation of the cells of the pia.

There is adhering to the outer layer of the dura a necrotic mass in part made up of pus, but chiefly of masses of lymphocytes, phagocytes and epithelioid cells, cells which one sees in tuberculous inflammations.

Histologically in the laboratory we were able to come to the conclusion that the type of process present in the dura was of the type seen in tuberculosis or syphilis. We believed that the process was of a tubercular peripachymeningitis.

From the autopsy, pieces of the bodies of the vertebrae were sent to the Pathological Laboratory, and recently Professor Warthin informed us that in these he found small caseous areas, which he affirms are due either to tuberculosis or syphilis.

This confirmation of our own diagnosis of a tubercular process, from the character of the changes in the tissues of the cord, clears up the pathology in a very interesting and instructive manner. There was apparently a tuberculosis of the vertebrae of the cervical region, with a purulent process extending from this out into the tissues of the adjacent muscles of the neck and a more recent extension of the process inward to the dura mater, producing a compression myelitis of the cord.

There are a number of interesting points about the case. The first point is the matter of diagnosis. We had a young girl coming in at the time when one was hearing much of poliomyelitis. At first the knee jerks were present. Later, the knee jerks were gone and there was a temperature and indefinite nervous symptoms. However, the very complete picture of a transverse myelitis rather spoke against poliomyelitis. Furthermore, the sensory disturbances, which rapidly developed were against that diagnosis. Another interesting point in the case was the absence of knee jerks in a transverse myelitis. We are accustomed to believe that where there is a compression myelitis a spastic condition results with increased knee jerks. However, we know from a rather large number of examples in the literature that in lesions of the cervical cord the usual picture is that of a flaccid paralysis with absence of reflexes in the legs. Any reason for this is purely theoretical. No explanation holds against criticism. It is sometimes said that there is in addition to the high focus, a focus of degeneration in the region of the nerves to the quadriceps femoris. However, in this case the nerves in this region were normal.

The condition is a compression myelitis, and yet there does not seem to have been much compression. That opens a very interesting line of thought as to how this does occur. Here we have a softening of the cord through a considerable area which was not due to an infection. Practically it was a dropsical condition of the cord and subsequently a softening or breaking down of the tissues. Such changes are often seen in compression myelitis. And yet they are not due to the direct contact or impinging of a foreign substance upon the cord itself. The cord is more or less easily adaptable to foreign bodies in the canal. It is, however, probably due to some changes which this compressing substance has upon the circulatory structures in the epidural spaces. We have in these spaces a very rich venous plexus carrying off blood from the cord. It has been shown that if anything interferes with this venous arrangement there very quickly occurs softening of the cord underneath. It would seem that this theory quite adequately explains the conditions in this case. It is rare to have a case develop so completely while under observation.

DISCUSSION.

DR. NELLIS B. FOSTER: The case was particularly interesting to all of us because of the diagnostic problem involved. It is one of the most confusing cases which I have seen, coming at a time when we were all of us looking for cases of anterior poliomyelitis. This girl who was a proper subject, the first few days when she was under observation might well have been a case of poliomyelitis. After a couple of days of observation it was quite evident that it could not be anterior poliomyelitis. Then one thought of an atypical tuberculous meningitis. We made an anatomic diagnosis of transverse myelitis but we could not make an etiologic diagnosis.

DR. BARRETT: The question was asked, "Why no fluid was obtained by the second and later lumbar punctures." It does not seem possible to answer this with any certainty. It might be that the extreme dropsical condition of the upper segments of the cord may have taken up some of the fluid of the canal.

One may speculate as to why the tendon reflexes of the lower extremities sometimes disappear in lesions affecting the high cervical regions. A very suggestive theory for this is that where the paths to and from the brain are cut off there may be a marked loss of tonus essential for reflex activity, which is preserved through the flow of nervous energy from the brain to lower levels. This is in harmony with the fact that in this case the Babinsky reflex was obtained a few times and then lost.

A CASE OF MULTIPLE SCLEROSIS DEVELOPING DURING AN ACUTE PULMONARY TUBERCULOSIS.

THEOPHIL KLINGMANN, M.D.
(From the Neurologic Clinic, University Hospital, Ann Arbor, Michigan).

The patient, a girl, 16 years old entered the University Hospital on July 18, 1916, complaining of difficulty in walking and talking and blurring of vision. Further she observed that her eyes turned in, all of which developed about the middle of June, 1916. In May of the same year she had a severe attack of measles from which she made a good recovery. About two weeks after her recovery from the measles she developed a severe "cold" with severe headache and was in bed for two weeks, the headache continued for one week, during which time there was nausea and vomiting. At the end of two weeks she was unable to walk without support and she had a speech defect, blurring of vision and paralysis of the internal recti. About ten days later she began to improve; one of her eyes resumed its normal position, the speech defect was less pronounced and she could walk better but several weeks later she suffered from retention of the urine; there was no incontinence. With the beginning of the present illness there was suppression of the menses.

In the previous medical history it appears that she was ill in December, 1915, when it was thought that she had influenza. She was not confined to bed and made apparently a good recovery at the end of two weeks. A few weeks after this illness she had spells of sleepiness during the day and suffered from more or less headache and backache all of which lasted four or five weeks. In early childhood she had whooping cough and chickenpox.

The family history reveals that the patient had one sister who died in childhood of spinal meningitis following measles and another sister who died of cholera infantum at the age of eight years. She has two sisters living, one has appendicitis and one is suffering from a deformity contracture of the flexors of the left arm and a deformity of one foot which came on after an attack of measles when she was eighteen years old.

The patient was first examined on July 20, 1916, by Dr. Camp and the following notes were made: The patient is well nourished and says she feels well. She has an impediment of speech, not a scanning speech. There are no enlarged glands of the neck, the teeth are irregular but in good condition, the scapulae are scaphoid. There is a slight internal strabismus, the left eye does not rotate outward normally. The pupils are equal and react to light, the left pupil is slightly sluggish, both react normally in accommodation. There is no tremor of the tongue, no paralysis nor atrophy and no paralysis nor tremor of the face muscles. There is a slight intention tremor of the hands more marked in the right. There is no atrophy nor deformity of the hands. In grasping objects she is awkward with both hands, especially with the left. The biceps and triceps jerks are increased but equal on both sides. The knee jerks are present, the right being more prompt. There is an ataxia of the feet. The plantar reflex is normal on both sides.

Ten days later the examination showed some changes; the pupils were prompt to direct light stimulation but the paralysis of the external recti was more marked and the outward excursion of both eyes was limited. There was a horizontal nystagmus on lateral deviation of the eyes. The speech defect was more marked, explosive and halting in type. The hands were more ataxic but there was no change in the gait. The tendon reflexes were all increased with an ankle clonus on the left side but a normal plantar reflex on both sides. Soon after this the patient left the Hospital. She was given small doses of Fowler's solution and elix. phos-

phate of iron, quinin and strychnin. She returned to the Hospital on October 12th much encouraged and rather euphoric. She was still coughing and had some expectoration. The dyspnea was more marked especially on slight exertion and owing to this she was referred to the Department of Internal Medicine. A sputum examination was made but it revealed nothing of importance. The patient had some physical signs of pulmonary disease. The X-ray showed an interesting condition and the report from the Department of Roentgenology is as follows: The lungs are uniformly peppered with small opacities the size of a millet seed, some of them grouped but mostly they are discreet and have all the characteristics of miliary tuberculosis of about the fourth to the sixth week. A greater area shows a slight opacity of the left apex which may possibly represent an older lesion. There are no enlarged thoracic glands.

The neurologic examination at this time was as follows: The pupils react promptly to light and in accommodation. There is marked horizontal nystagmus but no extraocular palsy. The tongue is protruded straight and without a tremor; there is no facial palsy. The movements of the hands are ataxic especially the right. The station and gait are ataxic. The biceps and triceps jerks are brisk, the knee and Achilles jerks are equal and about normal. The plantar reflex is not obtained on either side. There is no objective disturbance of sensation of any kind.

Ophthalmoscopic examination, July 24, 1916. There is a slight paling of the temporal portion of the disc of the right eye, the disc in the left eye is hyperemic, the retina is also hyperemic. There is paralysis of the left external recti.

Serologic and chemical examination of the spinal fluid, July 22, 1916. The spinal fluid is clear and colorless and the number of cells normal. Nonne-Apelt phase I negative, phase II negative. The reducing substance is slight. Wassermann reaction negative. The Wassermann reaction on the blood serum is negative.

The case is of interest, first, because repeated neurologic examinations were possible at intervals of from two weeks to two months showing changes in the clinical picture. Most of the symptoms were transient, some of them became permanent while others disappeared entirely. Second, the physical signs of pulmonary disease were slight, while the X-ray picture showed an extensive process in both lungs. The ophthalmoscopic examination was in accord with the neurologic condition. Third, the neurologic disease developed with the pulmonary tuberculosis. It is possible that the first illness in December, 1915 was tuberculosis, at least the X-ray picture would lead one to think so from the older lesion. Although slight but definite signs of a nervous disease followed it is also possible that this condition began at that time and that the illness coming on a month later was only an exacerbation of the already developed conditions and that the attack of measles was the inciting cause.

Last year I reported three cases of multiple sclerosis which came to autopsy, all of them having definite signs of tuberculosis in the lungs. I have had one since this report in which the autopsy revealed a pulmonary tuberculosis.

DISCUSSION.

DR. D. MURRAY COWIE: I should like to recommend the advisability of running some of the chemical tests, the diazo and permanganate tests.

DR. MARK MARSHALL: I had the opportunity of examining this patient. The sputum was examined and found to be negative so far as tubercle bacilli are concerned. The physical signs in the lungs were just what would be expected from the examination of the X-ray plate. There were crackling râles of every size in every part of the chest and to some extent there were piping râles. If the patient had remained longer we would have made more sputum examinations using the concentration method in the hope of finding tubercle bacilli.

DR. KLINGMANN: The tests Dr. Cowie spoke of were not made, since the patient left the hospital before her examination was completed.

TREATMENT OF DIPHTHERIA CARRIERS. REPORT OF 125 CASES OF DIPHTHERIA.

D. MURRAY COWIE, M.D.
(From the Pediatric and Contagious Disease Clinic, University Hospital, Ann Arbor, Michigan).

Dr. Cowie read a paper on the above subject. He reported a series of 125 cases of diphtheria, seventy-nine of which he treated by the use of the various methods proposed for the elimination of the diphtheria bacillus from the throats of diphtheria patients and forty-six cases by the vigorous use of the kaolin treatment. The results were the same with the kaolin treatment as with the other methods employed. He also reported seventeen cases of diphtheria in which tonsillectomy and removal of adenoids were employed to clear them up. In 86 per cent. of these cases the throat and nasal passages became negative to the Klebs-Loeffler bacillus within a comparatively few days; as soon as the inflammatory reaction following the operation was over.

Dr. Cowie called attention to the fact that

all cases of diphtheria terminate in what may be called a carrier period, because there is almost invariably a certain number of days, after the patient has recovered from the acute infection, during which the bacilli persist in the nose or throat. Accordingly, he classified carriers as short and long carriers. He pointed out that long carriers are often individuals who have never had the disease themselves.

The important points brought out in the paper are: 1. That no case should be discharged from quarantine until at least three consecutive negative cultures, very carefully taken, are obtained; better four. He referred to the paper of Dr. Walthall on the method of taking special cultures in these cases, given before this Society last spring. The idea of this thorough examination is to terminate all short carriers. 2. That for all refractory cases and bona fide instances of long diphtheria carriers tonsillectomy and removal of adenoids are the most efficient methods of eradicating diphtheria organisms from the upper respiratory passages. The operations are unattended by serious results. No cases of reinfection have occured. In almost all cases of diphtheria the tonsils are involved. In most carriers the organisms are confined to the tonsils or adenoids.

DISCUSSION.

DR. JOHN A. WESSINGER, City Health Officer: It does not seem to me that we should let this paper pass without saying a word upon the subject. I cannot help but feel extremely interested in the work which Dr. Cowie has done from the standpoint of epidemiology as well as the standpoint of public health. The problem of the disposition of the carrier of disease is an important problem and a puzzling one. I am aware that a great deal of work has been done along this line with the diphtheria carrier. I am glad to be in accord with what Dr. Cowie has said upon this subject. I am glad to hear that so much has been accomplished by the use of kaolin. I have given some attention to this subject during the last two or three years and I had rather formed the impression that the successful route of elimination of the carrier of disease would be a biologic one or by means of antagonistic bacilli. Two or three years ago we did some work along these lines. Previous to that time one of our schools in the city was perennially afflicted with diphtheria, three or four cases each year in that particular school. We made an examination of the throats of 150 children and found twenty-one diphtheria carriers. That work was done previous to the kaolin method and we felt at that time that we had attained a measure of success at least with the lactic acid bacillus. I notice that since that work has been done we have had no more trouble in that school. While the work done by Dr. Cowie and his associates and the men in Chicago seems to be in favor of the kaolin methods, there are others who seem to discredit this method. So it still seems to be in an experimental stage. I believe we have been in the habit of discharging our quarantine cases altogether too early. I am glad to know that it requires three negative cultures in this institution before cases are dismissed and I wish it might be four. All of us who have had experience with diphtheria carriers know that they are tonsillar. I have always supposed that it would be very, very difficult to reach bacilli lodged deeply in the crypts with any chemical or mechanical means less than a total extirpation of the tonsil. For that reason I can see why it would be a good thing to do a total extirpation of the tonsils as well as the adenoids in these patients. I believe that is the best method of getting rid of the carriers. I hope that the treatment with kaolin will work out successfully.

While I am on my feet I wish to make a slight digression. We are remarkably free from contagion in this city at the present time. There are no placards out but there is an outbreak of smallpox in a neighboring city. I hope that we shall get no smallpox from that outbreak but I fear that we shall. We have 33 students in the normal school who are residents of Ann Arbor. I therefore wish to ask the physicians to be cautious in making a diagnosis of chickenpox. I think it would be well for the contagious ward to be in readiness because we may get some.

LANTERN SLIDE DEMONSTRATION OF RADIOGRAPHIC FINDINGS.

JAMES G. VANZWALUWENBURG, M.D.

(From the Clinic of Roentgenology, University Hospital, Ann Arbor, Michigan).

1. Case of extensive diverticulum of the esophagus.

2. Case of supposed sarcoma of the knee. Thorax showed erosion of the ribs. Hip shows expansion of the great trochanter. Curious moth-eaten texture of the skull cap. Wrist shows similar defects. Another defect in the metacarpal. In the phalanges hairlike nap on the periosteum. Diagnosis open.

3. Case of large kidney with large stone in the pelvis.

4. Case of aneurism without enlarged or displaced heart.

5. Case of lumbarized first sacral.

6. Calcified hematoma.

7. Case of fracture of the skull by exploding dylitis deformans.

8. Case of supposed Pott's disease. Spondylitis deformans.

9. Case of migrating needle in the foot.

10. Case of stone in the bladder.

11. Case of calcified glands in the hilus of lungs.

12. Case of post pneumonic infection of the lungs.

13. Case of pulp stone in the tooth. Also lime absorption in the mandible. Jaw locked.

Probably an old fracture and congenital deformity.

14. Case showing areas of decalcification at the ends of teeth. Also showing poorly filled root canals.

15. Case of anomalous tarsal bone, os trigonum.

The last case is illustrative of a class of cases that frequently lead to considerable confusion of the inexperienced.

Fig. 1. Injured foot. Shows the accessory tarsal bone simulating a fracture of the posterior tubercle of the astragalus, requiring examination of the uninjured foot for comparison.

The patient presented himself for a football injury of the ankle. The radiograph taken at this time (Fig. 1) showed the posterior tubercle of the astragalus, apparently separated with a narrow fissure from the body of the bone. This fissure was rather clean cut with sharp margin and without the line of density which we usually see surrounding the separate and distinct bones which represent the cortex in tangential projection. A fracture of the posterior tubercle of the astragalus is not so rare, it being a minor injury frequently overlooked on the clinical examination and healing fairly kindly so that no suspicion is aroused against the diagnosis of sprain. Accordingly this diagnosis was tentatively made with the request that the patient be returned for an examination of the opposite foot to see whether the condition was symmetric. A second radiogram of the well foot (Fig. 2)

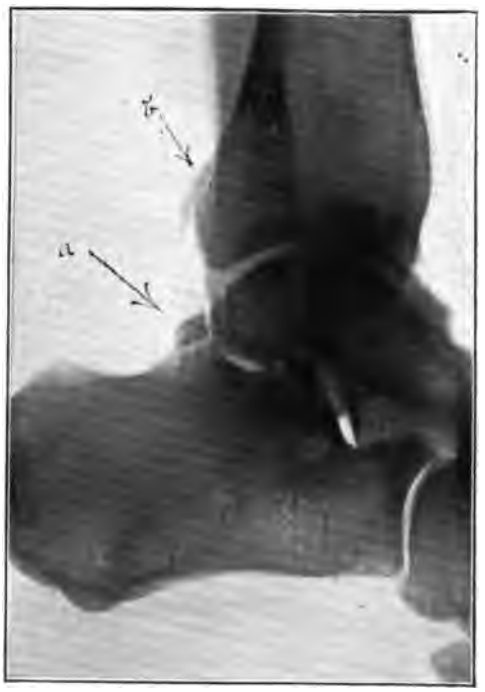

Fig. 2. The uninjured foot shows a similar accessory bone at "a." At "b" is seen an osteophyte, the result of a previous football injury.

shows a similar deformity and therefore leads to the diagnosis of anomalous tarsal bone.

No less than nine of these anomalous bones have been described. The majority of them represent ununited centers of ossification or vestiges of tarsae which have disappeared during the development of man. Several of these have been given names, among others this particular anomaly has been called os trigonum.

TRANSACTIONS

OF THE

Clinical Society of the University of Michigan

Stated Meeting, December 6, 1916

The President, CARL D. CAMP, M.D., in the Chair
Reported by REUBEN PETERSON, M.D., Secretary

A REPORT OF TWO CASES OF VON RECKLINGHAUSEN'S DISEASE. (NEUROFIBROMATA.)

HAROLD DE B. BARSS, M.D.
(From the Surgical Clinic, University Hospital, Ann Arbor, Michigan.)

The following is a report of two cases which were treated in the Surgical Clinic during the summer of 1916. They are of interest because they were a mother and son, each exhibiting different types of the same disease, one typical, the other almost unsuspected.

The first case, Mrs. S. V. a housewife, aged 25, entered the University Hospital on July 29, 1916, primarily for treatment of a large tumor on the left thigh. Examination on entrance, however, disclosed another condition of rather greater interest for this paper; a generalized neurofibromatosis.

The large tumor started without any known etiology about one year ago as a small mass on the posterior aspect of the left thigh. This gradually increased in size and was removed in May, 1916. It promptly recurred and a second operation was performed in July, 1916. But the growth took on a very malignant course and recurred with startling rapidity. The home physician refused to operate again and the patient was sent to the Clinic.

Examination on entrance showed a large fusiform swelling along the posterior aspect of the left thigh occupying the whole mid portion of the thigh. (Fig. 1). A long recent surgical scar traversed the length of the tumor. The mass was quite freely movable and not attached to the bone. The skin over it was red and shiny with some dilated veins coursing over it. A diagnosis of sarcoma was made and a radiograph ordered. This showed: "A soft tissue tumor of the posterior aspect of the thigh apparently entirely free from the femur." A course of Coley's mixed toxins was immediately started. Operation was delayed because the patient was in such a weakened condition that operative intervention was contraindicated. The toxins were given to a maximum dose of twenty minims and on August 27, the patient was discharged.

On September 17, 1916 the patient re-entered the Hospital. At this time a small portion of the tumor was removed under local anesthesia for pathologic diagnosis. The report returned was: "Small spindle celled sarcoma." The patient was in a still weaker physical condition and operation was again deemed inadvisable and Coley's toxins were again given. One week later the patient returned to her home.

The other feature found at examination was the presence of numerous cutaneous and subcutaneous nodules over the entire body. These were small, round, firm and painless, freely movable and located along the distribution of the peripheral nerve trunks. Associated with these masses, was a change in the pigmentation of the body, numerous larger and smaller brownish spots. In securing the history of the case, the patient stated that she had had these lumps as long as she could remember. An interesting fact brought out was that her mother, brother and a sister had the same condition. The lumps never distressed her and in themselves would never have brought the patient to a hospital. The laboratory findings were negative and the Wassermann test on the blood serum was also negative. A clinical diagnosis of Von Recklinghausen's disease (neurofibromatosis) was made. Two of these

little tumors, one cutaneous and one subcutaneous were removed under local anesthesia. In removing the subcutaneous tumor, a length of nerve was drawn out and along it were numerous smaller nodules. The pathologic tumor was firm, smooth, did not pulsate, was not reddened nor hot, and was only moderately tender. The laboratory findings were normal and the Wassermann reaction on the blood serum was negative. A radiograph gave no

Figure 1. Case 1. Mrs. S. V. Von Recklinghausen's disease showing the small neurofibromata. The large tumor on the posterior aspect of the thigh is a large sarcoma.

report on these specimens was: "Neurofibromata." Numerous young nerve fibers were found in both specimens examined.

Case 2. The second case is that of J. V. aged 4½ years. He was brought to the Hospital on August 12, 1916 because of a large swelling on the right side of the face in the region of the parotid gland. This was first noticed when the child was about two months old and appeared as a small bean sized tumor of the right parotid gland. It grew slowly till the spring of 1916, when it increased suddenly in size. The boy was taken to a hospital and an operation for removal of the tumor was performed in July, 1916.

Examination on entrance showed a swelling in the region of the right parotid gland, over which ran a perpendicular surgical incision but recently healed. (Fig. 2). The auricle was pushed out from the face and the external auditory canal was nearly closed by the swelling. There was a partial right sided facial paralysis. The information. A letter was written to the home physician to find out what was done at the previous operation, what the pathologic diagnosis was and whether the seventh nerve palsy was present at that time. The following is the surgeon's report of the case:

"We operated on the boy about six weeks ago after giving an unfavorable prognosis. At operation a large mass was removed, this mass extending up in temporal region, over the parotid and down in the neck. The clinical diagnosis of congenital lymphangiomata (hygroma colli congenitum) was made. The nerve was not involved. We advised the father that there might be a return. We refused to operate on mother. P. S. Removed all pathologic tissue. The growth extended in cord-like arrangement into deeper structures of the neck."

On August 26, 1916 an operation was performed in the Surgical Clinic. An incision was made along the line of the former incision. The structures were separated to the tumor

which presented a firm capsule which was incised. By blunt dissection with the gloved finger the area was explored. Suddenly there was an extremely brisk hemorrhage. The blood poured out in an alarming fashion. A gauze

Figure 2. Case II. J. V. Von Recklinghausen's disease showing the large tumor in the right parotid region caused by the plexiform neurofibroma of the facial nerve.

pack was jammed into the wound and strong pressure applied but this was wholly inadequate to control the hemorrhage. Quickly the neck was bared and an incision made along the anterior border of the sternocleidomastoid muscle. The muscle was retracted and the jugular vein and carotid artery were exposed. The vein was clamped but the hemorrhage did not stop and the carotid artery was clamped. This controlled the flow of blood and the two vessels were ligated. Gauze was packed into the cavity, the neck wound closed and a tight bandage was applied over the tumor. A portion of the tumor tissue was removed for pathologic diagnosis. The patient quickly recovered from the effects of the operation; the tumor decreased somewhat in size and on September 7, the patient was discharged to be cared for at home.

The specimen removed at the time of operation was examined by the pathologist who returned this rather unexpected report, "No evidence of parotid or parotid tumor in the small bits of tissue examined. Atypical connective tissue, blood vessels and nerves. Probably a congenital neurofibromatosis but positive diagnosis can not be made from this bit of tissue."

The first case gives a rather typical picture of the classical description made by Von Recklinghausen in 1882. He speaks of a "generalized affection characterized by the presence of small multiple tumors on nerve trunks, on the skin, associated with patches of pigmentation." Adrian in 1903 on a basis of 447 cases which he was able to gather from the literature, gives a very complete description of the disease, the theories as to etiology, symptoms, pathology, course, treatment and prognosis. He speaks of "symptoms of the first order" comprising tumors of the nerves, tumors of the skin, and certain pigment anomalies. Symptoms grouped in the "second order" are those of functional disturbances, intellectual and psychic changes, and maldevelopments of various kinds. So far as we could determine, the first case presented all the characteristics mentioned by Von Recklinghausen and comprised in Adrian's symptoms of the first order. None of the symptoms characteristic of the second order was discovered. In the literature there is only a limited number of cases in which nerve fibers have been demonstrated within the cutaneous tumors. In most cases their connection has been inferred from the presence of similar tumors on the palpable nerve trunks. This case did show the presence of true nerve tissue in the cutaneous nodules as well as those definitely associated with the nerve trunks.

An interesting conjecture, but one which we cannot prove, is the question whether or not the soft tissue spindle celled sarcoma developed from a preexisting neurofibromatous tumor, Ziegler in his pathology (page 419) states that cases occur in which neurofibromata take on a sarcomatous character and thereby become malignant. The portion of the tissue examined in this case was a pure sarcoma and it was not possible to show any nerve elements. Therefore, any vital connection or sequence between the two conditions can only be inferred.

The second case showed none of the generalized nodules either in the skin or along the nerve trunks, and there were no patches of pigmentation. We believe, however, that it is a case of neurofibroma for the following reasons:

The family history is suggestive. Most writers on the subject call attention to the hereditary nature of the disease. In our case the condition has appeared in three generations. The view most commonly held and one best founded is that this condition arises on an inborn tendency, an anlage, which exerts its influence at variable times after birth and leads to the proliferation of these particular structures.

The clinical findings at the first operation are in harmony with our diagnosis. The home surgeon's description is very well in keeping with the so-called "plexiform" type which is "characterized by the development in the domain of one or more nerve branches, of a convolution of tendril-like, twisted or interwoven, thickened and nodular nerve strands." In this process nerves are lengthened and thereby rendered tortuous and at the same time the nerves are increased in number. (Ziegler's Pathology).

Von Bergman in his Surgery (Vol. I, P. 504) reports a case of a child described by Soldan, in which the branches of the seventh (facial) nerve were converted into thick strands and beads in the deeper parts of a diffuse swelling occupying the cheek and thus constituting the chief mass of a tumor. Our second case as described in his physician's letter and our own findings, are quite identical with this case of Soldan's.

The pathologic report, rendered independent of all suggestion as to the possible nature of the condition, quite clinches the evidence and makes the diagnosis tenable.

DISCUSSION.

DR. CHARLES L. WASHBURNE: The report of these two cases is interesting, largely because of the surgical significance of the involvement of the nerve trunks, especially the large nerve trunks and the blood vessels. It indicates that a person who is to operate for multiple enlargement of subcutaneous tissues of the body has to be on the lookout for involvement of important nerves and blood vessels. I remember well when we opened this tumor that we were somewhat surprised to note that there was an intimate connection, not only between the jugular vein and the tumor, but also between the carotid artery and the growth. There was, as I remember, no nodular part of the tumor and a capsule rather dense containing a blood clot. As the blood clot was removed, we opened directly into the jugular vein and the carotid artery. The facial palsy present before the operation, which we had thought was caused probably by cutting of the facial nerve at the time of the former operation, began to clear up within a few days after the removal of the pressure, and I think it cleared up quite extensively before the patient was discharged. The packing was removed about the fifth day and there was no recurrence of the hemorrhage.

It is a pretty good rule to follow that any tumor in the neighborhood of the parotid gland should be closely examined for possible connection with the blood supply of the neck. I think Dr. Barss and I learned one thing from this case, that is, that when hereafter we have a tumor of the parotid region to operate upon, we shall first uncover the blood supply controlling that region and not be under the necessity of making such a rapid dissection down onto the carotid artery and jugular vein.

DR. ROY A. MCGARRY: I would like to ask whether the conditions of molluscum fibrosum and multiple fibromata are supposed to be the same thing among neurologists. I saw five cases which were considered by dermatologists as synonymous with Von Recklinghausen's disease. Most of these cases had no neurologic findings, though one man developed a painful tumor on the frontal nerve. The other tumors on the body were pigmented but there were no subjective symptoms. Also in two other cases there were a few small tumors over the body with no pain whatever connected with the tumors. I would like to know whether the conditions of molluscum fibrosum and Von Recklinghausen's disease are to be considered identical.

DR. CARL D. CAMP: I understood Dr. Barss to say that the jugular vein and the internal carotid artery were ligated. I think it would be interesting if Dr. Barss would say what symptoms, if any, appeared to follow the ligation of the internal carotid artery. In some cases the patient develops transient hemiplegia from this procedure and I believe there is a case now in the medical wards in which the patient has a hemiplegia in which the tentative diagnosis is thrombosis of the internal carotid artery.

DR. UDO J. WILE: I would like to say a word with regard to Dr. McGarry's query. There is a great deal of confusion existing as to what constitutes Von Recklinghausen's disease. In the original description, Von Recklinghausen's syndrome was a neurofibromatosis. Clinicians and those who have studied the pathology of this disease today are prepared to say that a case of clinical Von Recklinghausen's disease need not necessarily be neurofibromatosis. It may be, and frequently is a connective tissue tumor arising from connective tissue around the blood vessels. To be a Von Recklinghausen's disease clinicians feel that a case must have besides the tumors, pigmentation and the spontaneous disappearance of some of the tumors over a course of a long period of time. Conversely, there are many cases of neurofibromata which are in no way related to Von Recklinghausen's disease. That is, they are not associated with heredity, pigmentation and spontaneous involution. Such cases usually occur some time during young adult life and have not the same clinical picture or history. Molluscum fibromata are usually senile changes which have nothing to do with Von Recklinghausen's disease. I think this disease should be spoken of as multiple familial fibromatosis, and the connection with the nerve sheath should be disregarded.

DR. BARSS: In reply to Dr. Camp's question as to the symptoms following the ligation of the carotid artery, the most pronounced symptom was the stopping of the flow of blood. As a matter of fact, we could not discover even temporary symptoms following the ligation. The patient was extremely drowsy, but outside of that, there were practically no other symptoms. The boy, so far as we could tell, when he left the Hospital, was perfectly normal except that there was still a partial facial palsy on that side.

DEMONSTRATION OF A CASE OF MYCOSIS FUNGOIDES.

JOSEPH A. ELLIOTT, M.D.

(From the Clinic of Dermatology and Syphilology, University Hospital, Ann Arbor, Michigan).

The case which I wish to present is one of mycosis fungoides limited to one arm and shoulder. A little over a year ago Senear reported a case of localized mycosis fungoides from this Clinic and at that time he reviewed the literature. While he found a great many cases of mycosis fungoides, very few localized conditions were reported. The patient has changed so greatly in appearance since first coming into the Hospital that I will give you a description of the lesions when he first entered.

The patient is a slightly anemic man of good appearance. The scalp is clean. The eyes react sluggishly. The left arm is greatly swollen, being about twice the size of the right. Over the upper third of the forearm there is an irregular ulcer about four to five inches in its long axis and two inches across, the long axis being across the arm. The edges are irregular, slightly raised and erythematous with a slight seromucous exudate, the base being covered by a thin black crust. Over the elbow there is a much larger ulceration irregularly round, extending about half way around the arm and about six or seven inches in diameter. The base of this lesion is necrotic with marked loss of tissue at its center, forming a crater-like lesion. The tissue immediately surrounding these ulcerations is slightly erythematous, infiltrated, and in places covered by a slight scale. On the under side of the elbow there is a small ulcer the size of a quarter with a rolled border and a clean base, which has a serosanguinous discharge. Just above the large ulcer on the outer aspect of the arm there is an irregular raised lesion which is composed of small confluent nodules of a purplish color and covered by a slight scale. In the center of these lesions there is a depression which consists of blanched out tissue resembling a scar, the site of an involuted lesion. On the upper portion of the arm over the outer axillary fold is a large circular lesion which is raised about an eighth of an inch above the normal skin. It has a nodular appearance and is covered by a slight scale. Throughout the lesion there are small points of necrosis. The skin extending from the lesion under the arm is red, infiltrated and is also covered by a slight scale. Its extent is, however, very definitely demarcated. The edema of the entire arm is very marked, being more pronounced over the back of the hand and forearm. The glands in the axilla are markedly enlarged.

The general examination is negative. The blood shows one interesting finding, 34 per cent. eosinophils on entrance. A count taken today by Dr. Gilbert showed 24 per cent. eosinophils. The leucocytes have been as high as 30,000. The patient has received X-ray therapy with iodides and the lesions have decreased very much in size. The large lesion on the back of the arm has largely disappeared.

The symptomatology of mycosis fungoides is variable. However, in the typical cases it usually goes through four distinct stages. The

Figure 1. Mycosis fungoides showing nodular and ulcerative lesions on left arm.

first stage, or the so-called premycotic eczema, may vary anywhere from a few months to several years duration, one case being recorded where it extended over a period of twenty years. The nature of the eruption is also variable, usually being eczematoid in character, which does not respond to treatment. In some cases it may be urticarial or even erysipeloid. After a variable length of time the second stage, that of infiltration, is reached. As the infiltration increases tumors are formed which are characteristic of the third stage. Sooner or later these tumors ulcerate and become progressively larger, and the last or fourth stage of the disease

is entered upon. If the disease is untreated until this stage is reached the patient usually dies from metastasis and absorption.

As to therapy, some cases have responded to X-ray and potassium iodide. However, the cases which show the most marked improvement under this therapy are those seen before ulceration occurs. This has been true in the present case, as the large non ulcerative tumors have practically disappeared while those with ulceration are about the same size as at entrance. The patient's general condition remains unchanged.

Inasmuch as there are several theories as to the etiology of the disease I should like to have Dr. Wile discuss the relative value of each.

DISCUSSION.

DR. UDO J. WILE: As Dr. Elliott has brought out, this case is unique in its distribution. The condition is most often generalized. The customary name of the disease, mycosis fungoides, is a bad name as there is nothing mycotic or mycelial about the condition at all; so the name has been replaced in modern literature by "granuloma fungoides."

I think we may say that we know as much about the etiology of granuloma fungoides as is known about the etiology of leukemia. There is a great deal of speculation as to whether it is infectious, or primarily a disturbance of the blood forming organs. The theory which has the greatest interest is that there is a distinct relation between disease of the lymphogenous structures and granuloma fungoides. There are cases recorded of typical granuloma fungoides in which there are typical pictures in the blood of lymphatic leukemia. To complicate the matter, there are pictures of leukemia of the skin with tumor which look not unlike cases of granuloma fungoides. There are cases of leukemia of the skin in which the blood picture shows nothing, the so-called aleukemic leukemias of the skin. Paltauf, who has made an extensive study of the relation between lymphatic leukemia and granuloma fungoides, is of the opinion that the two, if not identical, are at least related diseases, and he bases this belief on the pathologic findings. If one were to examine this tumor, as we did, under the microscope, one finds a picture so strikingly similar to the leukemic infiltrates of the skin, that it is difficult to make a differential diagnosis. There is a proliferation of connective tissue which is filled with many small round cells. Histologically the cells are of the small round cell type. There are scattered mast cells, plasma and giant cells, but the great bulk of the infiltrate is similar to that seen in leukemia.

This is the third case that has been reported from this Clinic. The first one has gone down into the literature and will be recorded all over the world, the case which my predecessor, Dr. Breakey, treated here for a number of years. The extent of mutilation and destruction seen in that case is paralleled by no other disease except lepra mutilans. In this case the picture was more terrible because the lesions were ulcerative and destructive. The second case was the case which Dr. Senear reported and was a localized lesion. This is the third case.

Of some interest is the semilunar kidney shape of the lesion. The plaques in the second stage of the disease take a distinctly horseshoe or kidney shaped contour.

There is a metastasis to the viscera in the majority of these cases at the postmortem. The intestines particularly are the site of involvement, but nodes are found in the spleen, kidneys and all organs.

DR. ELLIOTT: The question was just asked when this condition began. The eczematoid condition began two years ago. The tumor was noticed July 4, 1916.

There are only two things which come into the differential diagnosis, sarcoma and mycosis fungoides. In mycosis fungoides we have the four stages, eczematoid, infiltrative, tumor formation, and ulceration. Sarcoma occurring on the skin is usually smaller and does not ulcerate. In Dr. Senear's case, it was impossible to make a diagnosis without the pathologic findings as the lesions very closely resembled sarcoma.

THE RELATION OF PERNICIOUS ANEMIA TO INFECTION. REPORT OF A CASE.

L. HARRY NEWBURGH, M.D.

(From the Medical Clinic, University Hospital, Ann Arbor, Michigan).

This case is interesting because of the suggestion in regard to the etiology of pernicious anemia. I will read the history first.

She was a married woman, aged 52, a housewife. She came here because she was weak. There was nothing in the family history. She had had some of the children's diseases. She did not have rheumatic fever nor tonsillitis, but did have typhoid at five years of age.

Her present illness began twelve years ago when she had hemorrhages from the bowel. These were large hemorrhages and occurred at irregular intervals until 1912. Since then there have been no hemorrhages. Accompanying the hemorrhages there was great weakness and dizziness. The patient has also had severe headaches, some loss of appetite and considerable edema. She has been dyspneic, especially at the time of the hemorrhages. At that time there was also palpitation. Six weeks ago the picture changed. She began to have diarrhea following which she became very weak, for which condition she came to the Hospital. Up to six weeks before entrance, which was the 20th of October, she had been doing her work. She has had some fever but no chills.

The history is quite indefinite—weakness, an old history of large hemorrhages from the bowel which have not occurred since 1912, then the vague history of weakness and the recent diarrhea.

Examination showed a woman with extreme pallor, dyspneic, with edema of the legs, and some fiuid in the abdominal cavity. There was nothing in the lungs. Her heart showed a mitral stenosis and regurgitation with irregular pulse. Her blood was typical for pernicious anemia. There were a number of examinations by Dr. Gilbert. The red counts averaged about 800,000. The white count was continuously low, averaging about 3,000. The hemoglobin was 25 per cent. Thus she had a positive color index. Differential count, polymorphonuclears 62 per cent., lymphocytes 27 per cent. Numerous blasts. Examinations of the urine, stools and Wassermann tests were negative. Also the neurologic examination was negative.

Thus the positive findings on physical examination were the extreme pallor, lemon yellow color typical of pernicious anemia, the heart lesion, the blood picture which could not be distinguished from pernicious anemia, and fever. She ran a fever which gradually diminished during her stay here. It averaged 100° to 102° during the first week. During the second week it was a little lower. During the last week of her stay she had practically no fever.

The question which interests us is the relation between the fever, the heart and the anemia, and the large spleen, which I neglected to mention.

We have made two blood cultures, both positive. We are not able to state definitely what organism is present. Probably it is a streptococcus.

During the last few years the term pernicious anemia has been considered a rather bad one by many clinicians because pernicious anemia has been considered synonymous with primary anemia. We are beginning to believe that pernicious anemia is not primary. In other words, we believe that what we have called pernicious anemia is always secondary to something else, that it is nothing more than a secondary anemia with special characters. Of course, when we get any etiologic clue, we consider it of great interest. We know that this type of anemia occurs in Scandanavia very commonly following infection with bothriocephalus latus. On the Atlantic coast of this country such cases are not at all unusual.. That anemia is certainly not primary because the mere removal of the worm cures the anemia. Then there is another group of cases which definitely follow pregnancy. There is one at present in the ward. The third group includes those which result from repeated small hemorrhages. I have seen two cases following hemorrhoids, both diagnosed as pernicious anemia and both cured by removal of the hemorrhoids. Then there are cases which are thought to be connected with syphilis, and there is such a case in the ward which seems to be making some improvement. There are other cases which may be connected with tooth infection. That, of course, is more difficult to prove.

Here we have an example which seems to be very definitely connected with an infection. There is the organism and the blood picture. As far as I can tell, there are no such cases in the literature as I have not been able to find a report of a single case of pernicious anemia from which organisms have been obtained in pure culture from the blood.

Of course, the other question is whether this woman has two diseases, an acute infectious endocarditis which is common enough, and a so-called pernicious anemia which is not uncommon. It is quite possible that she has the two conditions together.

DISCUSSION.

DR. QUINTER O. GILBERT: There is one interesting thing in connection with this case and a great many other cases which terminate in the so-called pernicious anemia. That is the history of hemorrhage. A great many observers have written about the association of hemorrhage and pernicious anemia. There is another case in the ward now which apparently started from a severe nose bleed. We cannot rule out in this case the fact that the disease started by marked disturbance of the hematopoietic system, by a severe hemorrhage superimposed upon a secondary infection. Probably many cases occur with some condition causing a disturbance in the hematopoietic organs following by a secondary infection or metabolic disease which will throw a greater strain upon the depleted hematopoietic system, so that it cannot respond, and as a result, an anemia follows with the earmarks of pernicious anemia. This is illustrated by another case, which is in the ward now, with a definite familial history of syphilis and

lead anemia some years ago. He now has the characteristic picture of pernicious anemia.

The organism which we have isolated from this case is apparently a hemolytic coccus of some sort, a very slowly growing organism.

DR. ADALINE E. GURD: I have been much interested in the report of this case especially the findings of the examination of the blood. I cannot say that I believe the massing of the cases in that manner is going to lead us in the right direction. I have been accustomed to diagnose pernicious anemia after I have seen the pathologic specimens after death, and they are typical. In fifty per cent. of our cases we find that they have been cases which have not been pernicious anemia, cases in which there have been large hemorrhages, which I would call secondary anemia. In the past week we have had a case of sarcoma sent in to us as pernicious anemia. In pernicious anemia the pathologic picture is typical and definite. I believe the origin of pernicious anemia is going to be found through chemical and not pathologic work. The lesions which we find constantly in the cord are of such an extremely severe nature that one must assume that they are made by some extremely active chemical substance. There have been very extensive experiments made in Europe on the dysentery toxin and there has been a condition in the cord which is similar in the manner of destruction but not in position. The dysentery toxin destroys the cells of the anterior horns. In all these other conditions which are mixed with pernicious anemia, there is a reparative stage, but there is none in pernicious anemia. Therefore I regret to see any classifying of all sorts of cases as pernicious anemia.

DR. R. W. KRAFT: I would like to inquire as to the frequency with which a count of 3,000 leucocytes is met with in a streptococcus infection.

DR. CARL D. CAMP: I was under the impression that in syphilitic anemias there are certain characteristics of the blood picture which might differentiate it from the pernicious or primary anemias, such as hyperlymphocytosis. With relation to the neural conditions of pernicious anemia, I have at present under observation an interesting family in which there are two brothers and a sister. Both the brothers have a neural type of progressive muscular atrophy. The sister has pernicious anemia, the pernicious anemia having been diagnosed in the Medical Clinic by Dr. Dock.

DR. NEWBURGH: It certainly is true that there is a difference between these cases for which an etiology can be found and another group which may be called idiopathic pernicious anemia. The cases with etiology do not have the spontaneous recoveries so far as one can see. I have not been able to find a single example of, for instance, bothriocephalus latus pernicious anemia which has recovered spontaneously, and then has gone down again. That may be the essential difference. On the other hand, it is absolutely impossible to distinguish from the clinical side between what we may call idiopathic anemia and this other group, so that from the purely clinical aspect, it is at least important to realize that all blood pictures which suggest idiopathic anemia are not primarily pernicious, that there are a certain proportion which are curable in a simple way. There are some cases where a definite cause can be found and when the cause is removed the anemia disappears. Whether there is any closer relation than that, it is impossible to say. Certainly the large proportion of so-called pernicious anemias go on eventually to death without any definite etiology. Perhaps we are wrong in assuming that we can find a cause of this sort for all cases.

As regards the question of leucocytosis in streptococcus infections, of course, leucocytosis is the usual finding. With this particular type of anemia we would not expect a leucocytosis. Presumably the lack of leucocytosis goes with the pernicious picture and has nothing to do with the infection, but is simply a part of the general blood picture.

REPORT OF AN UNUSUAL CASE OF HYDRONEPHROSIS RESULTING IN A MEDULLARY CARCINOMA.

ROLLAN W. KRAFT, M.D.

(From the Genitourinary Clinic, University Hospital, Ann Arbor, Michigan).

The following case is of interest, principally from the standpoint of diagnosis and because it is the largest hydronephrotic kidney that has ever been removed in the University Hospital.

Mr. John S., aged 64, American, entered the University Hospital October 23, 1916, because of a large abdominal tumor.

The patient's father, mother and first wife died of carcinoma. One brother died of tuberculosis. There is no history of hemophilia.

In 1896, the patient was injured in the left side with a plow handle, breaking a rib. Following this a large tumor appeared in the left upper quadrant. The tumor was not painful and remained at about the same size until August, 1914. At this time, the tumor began to enlarge and in 1916 increased in size very rapidly. The patient began to have some pain at this time during movements of the bowels, especially after eating large meals and during attacks of enteritis.

Examination of the patient at this time shows a man, average sized frame, rather poorly nourished, with a dry skin. There is a moderate cyanosis about the face with dilatation of the

superficial capillaries. The axillary and inguinal glands are palpable, but the epitrochlears can not be felt. The pupils are symmetrical and react normally to light and to accommodation. Extraocular movements are normal. The sclera and conjunctiva are negative. The teeth are in poor condition. The tongue is clean, protrudes without deviation or tremor. The mucous membranes are negative. The thorax is broad, the anteroposterior diameter being increased. The ribs flare out in the left lower chest. Tactile fremitus is normal,

Fig. 1. Case of closed hydronephrosis with large stone in ureter and pelvis. The wall of the cyst had undergone carcinomatous degeneration. (a) Tumor as outlined by inspection showing notch.

resonance is good, the breath sounds being somewhat emphysematous in type. There is dullness in the left lower chest as high as the sixth rib. The liver dullness begins at the fifth intercostal space. The patient has a slight seborrhosic dermatitis.

Heart.—Apex impulse is felt and seen in the fourth intercostal space just inside the nipple line with no enlargement to the right. The aortic second is louder than the pulmonic second sound.

Back.—Moderate scoliosis. Left side is fuller than the right.

Abdomen.—There is a large cystic tumor in the left abdomen, which begins at the left hypochondrium on a level with the ribs. (Fig.1). The tumor fills this inside of the abdomen extending a hand's breadth below the umbilicus, and to the right beyond the umbilicus. Just opposite the latter a distinct notch can be felt. On percussion the mass is dull. The colon was inflated and the area of dullness is decreased. The colon seems to cross the lower part of the tumor but is displaced to the inner side in the region of the splenic flexure. The tumor can be raised from behind during bimanual palpation. Heavy percussion causes pain in the costovertical angle. The tumor moves slightly with respiration. There is no muscle spasm and very little abdominal tenderness. Deep pressure with sudden release causes pain.

Reflexes.—Are prompt and equal on both sides.

There is no edema. There is evidence of an old fracture in the left femur. Examination otherwise negative.

Cystoscopic examination.—Patient cystoscoped by Dr. Kraft. Bladder is negative, except for a slight trigonitis. The right ureteral opening is normal. Left ureteral opening is situated high on a papilla which has the appearance of a blackberry. The right ureter is easily catheterized, the left ureter, with difficulty. No urine is obtained from the left side. The right catheter drains in the usual manner. Phenolsulphonaphthalein test on this kidney gives, first hour 25 per cent., second hour 26 per cent., total 51 per cent.

Thorium double acetate was injected into the catheters by the gravity method and the patient X-rayed.

X-ray report is as follows: "Upper plate is fairly satisfactory. The right kidney pelvis is not completely injected but appears normal in every respect. The left ureter rises to the level of the upper border of the fourth lumbar near the median line approaching it in a fairly broad curve. There is a double loop in the bladder. The upper end of the ureter is dilated and its termination is about three-quarters

of an inch below and its course in the last inch about parallel to the lower border of the large shadow which we consider a stone in the pelvis of the kidney. This stone is approximately one and one-half inches in diameter and covers the left lateral portion of the third lumbar vertebra. The outline of the tumor mass is easily followed, smooth without bossae, has a perfect outline of the lower pole of an enormously enlarged kidney. Lower plate is negative.

"Diagnosis; hydronephrosis with calculus in the pelvis of the kidney."

The patient's stools were negative. The specific gravity of the urine was 1025, the reaction was acid and at one time there was a trace of albumin.

The blood picture showed 4,500,000 reds and a leucocyte count varying from 20,000 to 25,000 on different occasions. The hemoglobin was 75 per cent. The differential count showed the following:

Lymphocytes, small ..... 2.5 per cent.
Lymphocytes, large ..... 3.0 per cent.
Transitionals ..... 4.2 per cent.
Polymorphonuclears .....87.0 per cent.
Large mononuclears ..... 3.5 per cent.

The blood urea gave 0.0624 grams per 100 c. c. The diastolic blood pressure was 90, the systolic, 135. The Wassermann examination was negative.

A two stage operation was decided upon. An incision was made parallel to the twelth rib and the peritoneum stripped from the tumor. The fatty capsule was very atrophic and all that remained of the kidney was a large cyst. A trocar was introduced into the cyst and two quarts of liquid were drained off. A stone was palpated in the pelvis of the kidney. A tube was stitched tightly into the sac by means of catgut and the wound closed in the usual manner. Fluid from the sac contained urea, uric acid, cholesterin and fatty acid crystals.

Two weeks later, the sac having been drained and the patient's general condition improved in the meantime, the incision was reopened. The old hydronephrotic sac, still containing considerable fluid, although greatly shrunken

CHART SHOWING SYMPTOMS AND SIGNS OF CYSTS OF THE ABDOMEN.

	Injury	Jaundice	Early Appearance	Pain	Movement on Respiration	X-ray	Urine	Inflated Stomach	Inflated Colon	Blood	Stool
OVARIAN	—	—	From pelvis mid line	— Unless infected	—	+ or —	—	Above	Above	Negative	Negative
HYDATID	—	+ or —	Beneath liver	— Unless infected	+	+ or —	Albumin	Below and right	Below	Eosinophilia Sec. anemia	Negative
PANCREATIC	+ or —	+ or —	Median line above umbilicus	+	—	Helpful	Sometimes albumin	Above usually	Usually below	Negative	Fat not constant
OMENTAL	+	—	Nothing constant	—	—	Helpful	—	Above	Around tumor	Negative	Negative
KIDNEY	—	Very seldom	Either flank	+	+	Diagnostic	Albumin casts	Median and above	Over or median	Negative	Negative
SPLEEN	+	—	Splenic region	+ early	+	+ or —	—	—	Under	+	—

in size, was carefully dissected from the surrounding structures and delivered. The pedicle was clamped, the vessels tied with catgut and the cyst removed. Tube and cigarrette drains were placed in the cavity. Through and through silk-worm sutures were introduced and the usual layer sutures of catgut were inserted.

The appended chart gives the essentials in diagnosis of abdominal cysts.

The diameter of the sac at the time of the first X-ray was 12 inches and it contained over two quarts of fluid; in addition to the large stone there were several small ones.

The pathologic diagnosis was large old hydronephrosis with malignant degeneration, medullary carcinoma.

A careful history is very essential in the diagnosis of such conditions. On further questioning, this patient gave us the additional information that he had been injured by the caving in of a well and had been removed from the well by means of a horse attached to a rope which had been placed around his body. This terrible strain had been sufficient to render him unconscious for several hours and was followed by the passing of blood in the urine for several days. In 1879, patient passed 19 stones per urethram.

The determination of mobility should never be neglected. Hyatid and kidney cysts show some mobility on respiration in contrast to other cystic conditions. However, should any cyst be attached to movable organs or the abdominal wall, this diagnostic point may be rendered valueless. The differentiation of ovarian cysts from a hydronephrosis can always be made by cystoscopic and X-ray examination after injection of the kidney pelvis. Cysts tend to be displaced in the direction whence they came; a movable kidney tends to resume its normal position; a movable ovarian cyst tends to be displaced toward the pelvis. Pancreatic cysts may entirely disappear after inflation of the stomach and colon. In some cases, however, pancreatic cysts may appear above the stomach or below the transverse colon. The colon lies below tumors of the liver and spleen, with some exceptions. Omental cysts usually have a collar of distended colon about them when the latter is inflated.

We wish to thank the X-ray Department for aid in making this diagnosis possible and the Medical Clinic for transferring this interesting case and for their co-operation.

The patient made an uninterrupted recovery.

DISCUSSION.

DR. IRA D. LOREE: The case is interesting on account of the long time this man was ailing. We don't know whether his trouble dates from the later 70's when he passed so many stones per urethram, or whether it came in the later 90's when he received the blow on the side.

These cases of hydronephrosis are divided into two classes, large and small. A pelvis that holds four or five ounces is a small, and over that a large hydronephrosis.

The two stage operation was employed because this patient was not in good condition and besides the relief of so much pressure had to be taken into consideration. I don't think Dr. Kraft is quite right when he says this is the largest hydronephrosis ever operated in this Clinic. There was one four or five years ago, relatively much larger, occurring in a seven year old boy.

DR. QUINTER O. GILBERT: I think the clinical signs upon palpation and examination of this patient should not be passed over without a little more comment. The patient was in the Medical Clinic for about a week and it is frankly admitted that we all made a mistake in diagnosis. We thought up to the time of the X-ray that it was a splenic tumor. It extended up under the ribs, had a rather sharp edge which curved on the right side approaching the umbilicus with a definite induration. It felt, indeed, like a splenic tumor. We were unable at that time to make out any cystic nature to it until after we had Dr. Van Zwaluwenburg's report. We then could feel a slight change in resistance in the lower portion. On physical examination I think it was practically impossible to diagnose this as a hydronephrosis, as the physical signs were predominantly in favor of a splenic tumor.

DR. KRAFT: I have nothing further to say except that we do get cases, in the literature at least, of enlarged spleen with calcareous infarcts which might possibly resemble this very closely with the X-ray. Dr. Van Zwaluwenburg suggested that this might possibly be a piece of barium remaining in the bowel lying in a notch of the spleen. Of course, with the cystoscopic examination and the inability to secure any urine from the left side, the diagnosis seemed certain even without the X-ray.

TRANSACTIONS

OF THE

Clinical Society of the University of Michigan

Stated Meeting, January 3, 1917

The President, CARL D. CAMP, M.D., in the Chair
Reported by REUBEN PETERSON, M.D., Secretary

OCULAR CHANGES IN MULTIPLE SCLEROSIS.

WALTER R. PARKER, M.D.
(From the Ophthalmologic Clinic, University Hospital, Ann Arbor, Michigan.)

I wish to report a case of multiple sclerosis, showing characteristic eye symptoms and to conclude with a summary of the eye findings commonly met with in this disease.

Mrs. B., aged 32, gave a history of double vision coming on fifteen years previously, followed by partial failure of distant vision and diplopia appearing during an attack of nervous prostration, which symptoms have recurred at various intervals since that time. At the present time she complains of headache, uncertain gait, sometimes double vision and blurred distant vision.

Family History.—On the mother's side she has an epileptic uncle and an asthmatic aunt. She was one of three children, and had all the contagious diseases of childhood excepting diphtheria.

Personal History.—Sixteen years ago she experienced some difficulty in the use of her right arm which receded and two years later recurred in a more exaggerated manner. She says that the arm was completely helpless for a number of months and again recovered. The nystagmus is about six years duration. Insecurity upon her feet dates back two years. At the present time she has some loss of coordination in all four extremities with a tendency to spasticity in the left arm and both legs. The deep reflexes are unequally exaggerated throughout the body. There is a distinct tendency to ankle clonus and extremely active Babinski on both sides. Sometimes she walks with freedom but for the most part her gait is rigid and tottering.

Examination.—Vision in the right eye 6/60, with correction 6/12; left eye 6/21, with correction 6/12.

There is a marked nystagmus in the right eye present constantly and nystagmus on motion in the left eye, power of convergence limited, pupil moderately dilated, but reacts to direct and consensual stimulation, and in accommodation.

Ophthalmoscopic Examination.—Both nerve heads pale, otherwise negative.

Examination of the muscles showed a left hyperphoria of 1°, esophoria for distance of 3½°, exophoria of 9° in accommodation.

Field of vision showed bitemporal contraction of form, with a marked concentric contraction for colors, with some interlacing of blue and red. There are also numerous areas of partial scotomata, most marked in the temporal fields. Fig. 1.

Ocular Changes In Multiple Sclerosis.—In multiple sclerosis, the eye symptoms appear as disturbances of vision and of the extrinsic muscles, also as nystagmoid movements of the globe.

The visual disturbances depend, as Uhthoff has shown, upon an interstitial neuritic change in the optic nerve, optic tract and as far back as the occipital lobe.

The optic nerve may become involved at any stage of the disease. It may show changes that constitute one of the earliest manifestations of the disease. In fact the eye changes may precede all the other symptoms for several years. The patient may give a history of a limited period of impaired vision which entirely cleared up. The neuritis may be either papillary or retrobulbar, very rarely an outspoken choked disc.

The atrophy is not complete as in tabes and usually the affection is one-sided. One eye may recover and after a time the other become affected. The process may remain stationary for a long time. Occasionally a diffuse or temporal atrophy will result, leading to a permanent change, but rarely, if ever, does complete blindness occur. In fact, under proper treatment,

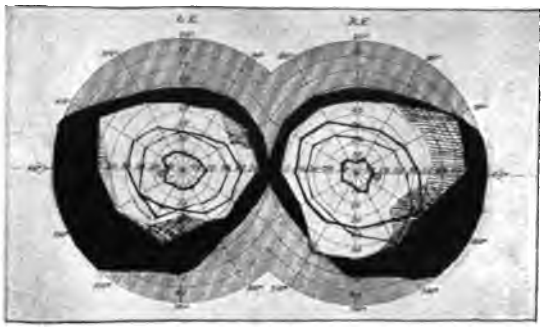

Fig. 1. Visual Field from Case reported.

improvement has been reported in about 50 per cent. of the cases. When the atrophy is secondary to a neuritis, the nerve may show evidences of the previous inflammation. The change in the optic nerve may develop quickly or be very insidious in its onset. In the acute forms the central vision may be greatly reduced and later almost completely recover, variation in the amount of amblyopia being quite frequent.

The visible ophthalmoscopic changes, which occur in about 50 per cent. of the cases, often bear no direct relation to the impairment of vision. The vision may be markedly impaired in spite of an absolutely negative ophthalmoscopic finding or the disc may appear considerably atrophied and still the central vision not be correspondingly reduced. Occasionally complete recovery occurs, but as a rule a distinct amblyopia persists. Lasting blindness is rare.

There is no regular narrowing of the visual field. There may be an irregular peripheral contraction, a central scotoma, or multiple scotomata. The scotomata may be relative or absolute for form or for color. More rarely a ring scotoma may be present. As the case improves the fields may become quite normal, although usually the defect becomes permanent. Fig. 2 shows characteristic multiple scotomata often seen in these cases.

When the visual disturbance takes the form of a central scotoma, the differential diagnosis between multiple sclerosis and retrobulbar neuritis may be difficult, especially when the latter is not due to chronic intoxication, has a sudden onset, and shows analogous fluctuations in intensity. It should be borne in mind in such a case that central scotomata are much more common in retrobulbar neuritis than in multiple sclerosis, and that in the latter disease the central scotoma is usually relative while in retrolbulbar neuritis it is ordinarily absolute Multiple sclerosis is present in about 3 per cent. of all retrobulbar inflammations of the optic nerve.

While true nystagmus is rarely present, the nystagmoid movements constitute one of the most important of the muscular symptoms of multiple sclerosis. They are analogous with the intention tremor of the remaining muscles and show especially in extreme positions of the eye.

Disturbances of the pupillary function, even variations in the size of the pupil are very rare in multiple sclerosis.

The palsies of the eye muscles occur in about 20 per cent. of the cases. They are nuclear or fascicular in origin, and practically always partial. They are, therefore, present in one or both eyes and often symmetrical. An ophthalmoplegia externo may be present but no cases of ophthalmoplegia interno have been observed. Not infrequently there will manifest itself in this disease, paresis of the associated movement of the eyes, of convergence, or an ophthalmoplegia externo as well as partial paresis of the oculomotor nerve. The oculomotor palsy is nearly always partial, while the abducens frequently becomes completely paralyzed. The palsies of the eye muscles may recover as in

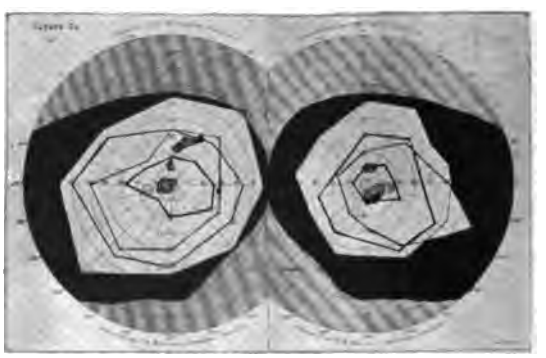

Fig. 2. Field taken from Case of Multiple Sclerosis showing Multiple Scotomata.

the case with all symptoms of multiple sclerosis, but as the muscles are as a rule affected late in the course of the disease, the loss of function may be lasting.

Occasionally there may be present in mutiple sclerosis the most severe general symptoms of brain tumor, including the choked disc. In such a case independent spinal cord symptoms,

as urinary disturbances and areas of anesthesia, may clear up the diagnosis.

Hysteria and multiple sclerosis are very frequently confused, especially when the latter occurs in a young girl. The eye symptoms alone can clear up the diagnosis in some cases.

DISCUSSION.

DR. CARL D. CAMP: Dr. Parker's paper has interested me greatly. I think the frequency of multiple sclerosis is very much underestimated in America. In Vienna and in Germany, more especially in the former, it is regarded as the most frequent of the organic nervous diseases, more frequent than tabes. In our clinic here last year we diagnosed multiple sclerosis 51 times, tabes dorsalis 98 times. The diagnosis is so extremely difficult in many cases that I would not be surprised if we had missed half of the cases of multiple sclerosis which we have seen. We have either diagnosed them as some other disease, or been forced to record the diagnosis as "not made." Considerable misconception arises probably from the fact that Charcot described a triad of symptoms as characteristic of the disease,—scanning speech, nystagmus and intention tremor. Most physicians diagnose the disease on that basis. As a matter of fact, probably not more than 30 per cent. of the cases show this triad of symptoms. Oppenheim has called attention to the purely spinal type of multiple sclerosis. I have seen cases that have come to necropsy from state hospitals for the insane in which apparently there was purely a mental clinical picture, and the examination of the brain postmortem, showed the cause of the mental symptoms to have been multiple sclerosis. On account of this difficulty in diagnosis, any assistance which we can get from ophthalmoscopic examinations or any examination that the ophthalmologist may make, is, of course, very valuable. One must remember, however, that there are many cases of multiple sclerosis in which there are no visual or ocular changes, just as there are other cases in which the visual or ocular changes constitute practically the entire clinical picture. It is important to make the diagnosis of multiple sclerosis because it is a disease which can be much benefited by treatment, and it may be, in some cases, cured.

DR. R. BISHOP CANFIELD: I was interested in what Dr. Parker had to say about nystagmus in multiple sclerosis. In that connection I would like to ask Dr. Parker how the nystagmus compared with the difficulty in vision. Was it most marked in those cases in which the difficulty in vision was most marked? I should like to call attention to the fact that one can differentiate between an intention tremor and a true nystagmus. There are definite ear findings in multiple sclerosis one of which is a nystagmus and that is purely of a vestibular type. I would like to ask Dr. Parker whether the nystagmus which he notes frequently is of the vestibular or auricular type. In the cases which I have examined in which typical nystagmus was present either as the result of some lesion in the vestibular tract or farther forward, not only a nystagmus but a well defined interference with the cochlear tract was also present. I dare say that I have examined some of the cases which Dr. Parker has also examined in this clinic. and in some of them the nystagmus was no doubt due to lesions posterior to the posterior longitudinal bundle, while in others it was distinctly of an auricular type.

DR. GEORGE SLOCUM: Most writers give the relative frequency of nystagmus in multiple sclerosis as about 70 per cent. of all cases. Of these cases 20 per cent. are stated to be true nystagmus, while the remaining 80 per cent. are said to be present on ocular movements only. While pupillary symptoms are not prominent miosis sometimes occurs, this symptom being present when there is considerable irritability to light.

Dyschromatopsia has frequently been noted in our cases and partial scotomata when present have usually been for red and green. These changes in the visual fields may have considerable diagnostic value when found in connection with other symptoms of multiple sclerosis. As stated by Dr. Camp the eye findings may often be of great assistance in the diagnosis of this disease.

DR. PARKER: In regard to the frequency of multiple sclerosis, I am glad Dr. Camp spoke of that point. Unquestionably it is the one nervous disease that comes to us first, more often than any other. It is not an unusual thing to see these patients in an ophthalmologic service before they have sought advice for other symptoms. The one other general disease where we are consulted first is perhaps nephritis, the loss of vision from albuminuric retinitis being the symptom that leads the patient to consult us. As the result of treatment in multiple sclerosis is much better in the cases which are cared for early, an early diagnosis is most important.

With regard to Dr. Canfield's question, in our own cases only about one-fourth show vestibular nystagmus, the other 75 per cent. of the ocular type. Our cases of multiple sclerosis showing nystagmus have not been classified with reference to the visual acuity and I am unable to say whether it has been more defective in the cases showing vestibular nystagmus than in those of the ocular type.

REPORT OF TWO CASES OF BLADDER TUMOR.

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The occasion for reporting these two cases is not so much on account of their infrequency, but rather, because surgery of the bladder, directed toward the removal of new growths, is still in its developmental stage, and because the end results obtained point favorably to the

operative and postoperative methods used in these two cases. One is impressed by a brief review of the literature, that at the present time there is no generally accepted method of interference. As evidence of this we find as many methods as there are authorities. One recommends the X-ray, another fulguration, others rely upon the operative cystoscope while a few advise only a radical procedure.

As a matter of historical interest, Warner, in 1747, successfully operated for a bladder tumor from above. Guyon is credited with the suprapubic method of approach. Franz was the first to advise total removal of the bladder. Brandenhauer in 1887, was the first to carry it out, however, unsuccessfully. In 1888, Pewlik made a successful total cystectomy. In this same year, Rydygier advocated the abdominal mode of attack. Yet too critical judgment cannot be passed upon the results of these earlier operators, in view of the advances made in diagnostic, operative and postoperative methods since their time.

In the diagnosis of these cases in general, one resorts to inspection, percussion and auscultation, not only as regards the size, shape and location of the tumor itself, but also any accompanying glandular involvement. A careful examination of the urine, and particles of tissue passed with the urine, also often give valuable information. And finally, the indisputable evidence is gained only by cystoscopic examination of the bladder interior. Having satisfied ourselves, by these methods, that the bladder tumor exists, it is equally important for favorable end results to become acquainted with the patient's general condition, including renal functions, blood pressure, blood urea, Wassermann, etc., before considering any operative procedure.

There are only four avenues of approach: The perineal, the pararectal, the vaginal and the suprapubic. The last is the best for the removal of primary growths of the bladder, as it admits a free exposure of the interior of the bladder, with sufficient room for accurate work, is by far the easiest method of approach and there is less danger of local postoperative complications.

The technic of the operation is briefly as follows, considering only those cases which require extraperitoneal subtotal cystectomy:

1. The bladder is thoroughly irrigated and distended with saturated boric acid solution, the catheter being left in place and clamped.

2. The field of operation is prepared and the patient placed in Trendelenberg's position.

3. A median incision is made, extending upward from the pubes halfway to the umbilicus. A transverse incision is made across the rectus and the fascia of the rectus so as better to expose that part of the bladder involved.

4. The prevesical fat and peritoneum are gently stripped upward exposing the whole bladder.

5. The point of incision into the bladder is located, edges caught with a double tenaculum, and long retractors inserted into the bladder. The tumor in this way is exposed. A wide removal is now affected, through all the coats of the badder. It may be necessary to use pedicle clamps during this part of the operation. The bladder is thoroughly sponged and a careful investigation made for further pathology. Especially is this necessary in villous papillomata, which type of tumor readily attaches itself to other parts of the bladder and in this way, gives rise to new tumors.

6. The bladder wall is then tightly closed with a double row of sutures, and the remaining steps of the operation are the same as for the closure of the wall in any abdominal operation, with the exception that a small cigarette drain is placed in contact with the lower angle of the bladder incision, to care for any bladder leakage.

7. The special points in the postoperative care are:

   a. A permanent catheter to prevent distention of the bladder.
   b. Daily irrigation of the bladder with small amounts of boric solution.
   c. Special measures to prevent urethritis and stoppage of the catheter.

The first case is that of a woman, Mrs. S H., married, age 42, who entered the genitourinary clinic on May 25, 1916, complaining of weakness, inability to be up and about, and bloody urine. The family history is negative. There is nothing of note in her personal history and her menses have always been regular. She was married at 22, and has had six pregnancies, with two miscarriages and two abortions, attributed to pernicious vomiting. There is no history of bladder disturbance up to the onset of the present illness. In December, 1914, the patient for the first time noticed frequent nocturnal micturition, the urine being bright red in color at the time. After being present for ten days, these symptoms disappeared as suddenly as they had appeared and the patient was apparently well, until the second attack, which occurred in February, 1915. During this second attack, small amounts of blood were passed in the urine inter-

mittently for six weeks, when the symptoms again disappeared. A third attack of hematuria occurred in the early part of July, 1915 and lasted for about a month. Between July and November, 1915, blood occurred in the urine but three or four times, lasting a day each time. During all these attacks and in the intervals between, the patient felt perfectly well, and has been able to do her work. In December, 1915, for the first time she noticed that she was passing large clots of blood in the urine, which continued up to the time of entrance to the University Hospital in May, 1916. During this latter attack, the patient was bedridden and lost thirty pounds in weight. The physical examination of the patient upon entrance showed a marked stage of exhaustion, a severe secondary anemia, with a blood count of 1,860,000 reds, 4,500 whites and 20 per cent. hemoglobin. Her Wassermann was negative. There were marked hemic murmurs over the precordia. The urine was loaded with albumin, and showed many red blood cells, white blood cells and casts. Her kidney functional test showed 20 per cent. and 10 per cent. the second hour, a total of 30 per cent. Cystoscopic examination showed papillomatous growths, one in the region of the right ureteral opening, the other mostly on the left side and low down. X-ray of the kidneys was negative. Transfusion could not be arranged, no donor being procurable. The patient was placed upon a strict regime directed toward her general condition, and in addition received daily irrigations of the bladder with 10 per cent. hot antipyrin solution. During her last month in the Hospital she received interval fulgurations with the hope of removing the papilloma on the right side, and as she refused operation palliative cauterization of the carcinoma was done and hemorrhage from the tumor controlled. As a result of this treatment the patient's condition rapidly improved, she was no longer a bed patient, her hemoglobin increased to 85 per cent., her hematuria stopped, she was stronger and gained fifteen pounds in weight. On July 27, 1916, cystoscopic examination showed the tumor on the right side of the bladder to be much smaller and the patient was discharged against our advice.

The patient returned to the Genitourinary Clinic on September 29, 1916, stating that at times, during her absence, she had had recurrences of her former symptoms but her general condition had apparently not changed since her discharge in July. Upon cystoscopic examination the papilloma on the right side of the bladder had entirely disappeared, but that on the left side was still present. This latter growth was fulgurated weekly until November, without any marked change. On November 7, 1916 the patient was operated upon and the tumor removed. The pathologic diagnosis of the tumor by Dr. Warthin, was: Carcinomatous transformation of a papilloma. This patient made an uneventful recovery and was discharged seventeen days after operation. She was advised to return for observation.

The second case, Mrs. D. H., married, aged 40, entered the Genitourinary Clinic on November 13, 1916, complaining of frequent and smarting urination and shreds in her urine. These symptoms were first noticed in January, 1916 and have been gradually growing worse. There is a family history on the paternal side of tuberculosis, Bright's disease and cancer. The patient has never been strong; as a child she had pertussis and typhoid at 14. She has had frequent attacks of tonsillitis with two mastoid operations, 1908 and 1911. Since her marriage she has had gonorrhea, tuberculosis and syphilis, having received treatment for the latter. Menstural history is negative. She has had six pregnancies, four of which were terminated by self-induced abortions. Her present trouble dates back to January, 1916, at which time she noticed frequent and burning micturition and the passage of shreds in her urine. At this time there was no marked pain. These symptoms have gradually increased in severity and on entrance, there was marked tenderness over the bladder, and sharp pain in the region of the right kidney. There has been very little tendency toward bleeding. Physical examination is negative. Cystoscopic examination on November 14, 1916 showed, on the right side of the bladder, a nodular tumor with an area of ulceration in the portion nearest the urethra. On November 21, 1916 the patient was operated and the tumor excised through all the coats of the bladder. On close examination it was found to have infiltrated the right ureter, the diseased portion of which was excised and the ureter transplanted into the bladder. Pathologic diagnosis by Dr. Warthin, is, medullary squamous

celled carcinoma. This patient is still under treatment.

DISCUSSION.

Dr. John W. Churchman: I unfortunately missed the earlier part of this paper, but I would be very glad to say a word about bladder tumors in which I have been interested for some time. I will speak first as regards my experience with fulguration. It has not been as satisfactory as the experience of others, particularly some of the New York men, and I think the particular danger of fulguration is the fact that we don't know, either by macroscopic or microscopic tests, any way to distinguish those tumors which will respond and those which will not. It is not altogether a question of malignancy. Even if one can excise a piece of the tumor through a cystoscope, one cannot say whether it is a variety which will respond to fulguration. Unless, therefore, fulguration of bladder tumors is controlled by a very careful cystoscopy, I think it is one of the most dangerous forms of therapeutics which we have.

As regards excision of bladder tumors, I think there could hardly be a field of surgery where excision would be more satisfactory, if it were not for the problem presented by the ureters. Rarely can a large part of the bladder be excised without injuring the ureters. I have under observation now a case in which a tumor was treated repeatedly with fulguration without effect, the patient being kept under repeated cystoscopic observation. It became necessary to excise certainly over half of the bladder and probably nearly two-thirds, so that we were quite doubtful whether we would be able to get a closure. Closure was made and the patient has from a functional standpoint, a perfectly normal bladder. He is a man of 55 years and passes his water about every three hours and gets up perhaps once a night. With the cystoscope, I think it would be quite impossible to tell that he had ever been operated upon at all. I think we have been unduly cautious in the manner of approach of these bladder tumors in not going through the peritoneum. It is quite a simple thing to do. If the peritoneum is opened at once and packed off just as you do in a pelvic case in the female, you can then dissect the bladder free, and the ureteral problem, attacked from the peritoneal cavity, is much easier than from the front through the bladder itself.

Where the ureter is involved, my own feeling is that either the case is not operable at all, or else a nephrectomy should be done. Of course, one can transplant the ureter in some cases into the rectum, or some part of the bowel, but the results on the whole have been pretty discouraging with transplantations into the bowel and there is no reason why a nephrectomy should not be done.

I think the important thing aside from the distinctly technical problem as to the removal of bladder tumors is that if the surgeon has any chance at all the results in excision of bladder tumors are extraordinarily good, and, secondly, that there is no way of telling positively by either microscopic or macroscopic appearance, which the dangerous tumors are, so that they should not be fooled with. They belong from a microscopic standpoint in a class by themselves. The appearances of some of the benign tumors border very closely on the malignant type, and many of the malignant tumors look very much like benign tumors, so that one should not draw conclusions from pieces which are dissected out. These tumors should be treated radically with an excellent chance of cure, and if fulguration is practiced, it should be done only under the most careful control with the cystoscope.

Dr. Reuben Peterson: I would like to ask Dr. Churchman to go into a little more detail about his results in transplantation of the ureters into the rectum, and if he has tried to treat these cases by tying off the ureter with the idea of atrophying the kidney. I was very much surprised at the recent meeting of the Southern Surgical Society to hear Charles Mayo relate the number of cases in which he had done the latter procedure. I read a paper before the Society at the same time, in which I described the technic of forming a cloaca in inoperable cases of vesicovaginal fistula, opening the rectum and then closing the introitus. In the discussion of that paper quite a number of men related their experiences, and some of them advocated the transplantation of the ureters into the rectum. They quoted Coffee and his technic. The results of my experiments made some years ago were that we never could tell in any transplantation of the severed ureter into the bowel what kind of an infection we would get. Some kind of an infection almost invariably resulted. It might be a pyemia or a pyelonephritis which would not destroy the life of the patient but would partially heal. Some of the results reported there were at entire variance with my experience. Dr. Franklin H. Martin about fifteen years ago did quite a number of resections of the entire bladder. He transplanted the ureters into the bowel and those patients who survived the operation almost invariably died of pyelonephritis.

Dr. Churchman: In reply to Dr. Peterson's questions, I have never transplanted the ureter into the rectum because in the first place, it seemed like a very bad surgical procedure, and in the second place, a review of the literature confirms that opinion. There have been a few successful transplantations if followed for a short time. If followed for a long time, a bad kidney infection follows. It seems to me a much better surgical procedure to remove the kidney at the time of the operation I have heard Dr. Mayo make the same statement regarding tying off the ureter. It is well known experimentally that one can ligate a ureter without always having the development of a hydronephrosis. This develops, not when there is complete stoppage, but when there is a partial stoppage. Complete stoppage gives atrophy. If you ligate a ureter, as is occasionally

done accidentally, you almost always get a urinary fistula because at first there is a little distension which through necrosis forces the ligature off, or the catgut dissolves resulting in leakage. So it is more difficult for me to understand why you don't get leakage of urine at first. It is hard to believe that that can be done with impunity. Doubtless one can do it occasionally and get away with it, but it seems to me at any event much safer to remove the kidney on that side because then you have no danger of infection, and these infections back of a ligated ureter are not always simple, but sometimes lead to pyemia and death. So if you have an infection, why not take the kidney out?

DR. ROLLAND W. KRAFT: The experience in the genitourinary clinic agrees with that of Dr. Churchman regarding the regeneration of the bladder. When the first patient left the Hospital, the line of incision had disappeared except for two dimples and one of these was very near the ureteral opening.

On December 21, 1916, Mrs. H. was cystoscoped by myself and the bladder was found in excellent condition. The line of suture was well healed, slightly dimpled in two or three places. The end of the incision came within one-half inch of the ureteral opining. Examination of the urine was negative and the general condition of the patient was splendid.

In regard to the differential diagnosis, we must consider all genitourinary conditions starting with hematuria, as the one principal symptom and often an only symptom in cases of bladder tumor is blood in the urine. Among such conditions are hemophilia, which can usually be readily ruled out. Renal hematuria due to parasites, injury, movable kidney, hydronephrosis, tuberculosis, syphilis, tabes, stone, tumor or hemorrhagic nephritis must always be thought of. All are easily ruled out by the accompanying symptoms and absolutely by the cystoscope. The ureter may give rise to bleeding because of a small polyp, a stone, a varicose vein or some trauma. This leaves the posterior urethra and prostrate to be eliminated. Primary bleeding from the prostate without any other symptom is very rare. Among the causes of bleeding from the bladder, primarily we have stone, tuberculosis, syphillis and varices. With the present technic of cystoscopy there is no excuse for mistaking any of these conditions. Both of these cases gave positive findings upon rectal and bimanual examination. Removal of a piece of tissue is not considered by some authorities as warranted. It was, however, done in both of these cases through the cystoscope by means of a snare and a positive diagnosis as to type of tumor established before the operation was undertaken.

HISTORY OF TRANSFUSION OF BLOOD —REPORT OF ONE HUNDRED AND FIFTY TRANSFUSIONS.

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The blood has been regarded as synonymous with life from the very earliest time. Many references are made to transfusion of blood in the writings of the ancient Egyptians. It was condemned in the works of Pliny and Celsus. Libavius in 1615 report in "Defensione Syntagmatis Arcanorum Chymicorum" as follows: "There is present a robust healthy youth full of lively blood. There is also present one exhausted in strength, weak, enervated, scarcely breathing. Let the operator have silver tubes passing between them; let him open an artery of the healthy one; insert the tube and secure it. Next let him find the artery of the patient and adjust the receiving tube. Now let him adapt the two tubes to each other and the arterial blood of the healthy one, warm and lively, dances in the vessels of the sick one; and immediately it produces the appearance of life and removes all languor."

It is recorded that the first transfusion of blood in man was performed by Jean Baptiste Denys of Montpellier, physician to Louis XIV, in June, 1667. The case was that of a young man dying from repeated venesection. and into his veins Denys injected the blood of a calf or a lamb. Following the operation the patient apparently recovered his health. The procedure was criticised very severely with the result that it was decreed, "For the future, no transfusion should be made on the human body, but by the approbation of the physicians of the Faculty of Paris."

There is an account, however, of transfusion in the case of Pope Innocent VIII, one hundred and seventy-five years earlier than this, to be found in Villari's life of Savonarola, describing three attempts made in transfusion of blood from three youths to the veins of the aged Pontiff, but with no improvement in his condition and resulting in the death of the boys. The "Life and Times of Rodrigo Borgia" gives another version refuting the above: "Three boys were bled until they died and the Pope drank a draught prepared from this blood, without benefit."

It seems probable that transfusions of blood were attempted before the time of Harvey's

discovery of the circulation of the blood in the seventeenth century.

The following is found in the diary of Samuel Pepys, describing the meeting at Gresham College: "November 14, 1666, Dr. Croone told me, that, at the meeting at Gresham College tonight, which it seems, they now have every Wednesday again, there was a pretty experiment of the blood on one dog, let out, till he died, into the body of another on one side, while all his own ran out on the other side. The first died upon the place. The other very well, and likely to do very well. This did give occasion to many pretty wishes, as of the blood of a Quaker to be let into an Archbishop, and such like; but, as Dr. Croone says, may, if it takes, be of mighty use to man's health, for the amending of bad blood by borrowing from a better body."

In a footnote is given the following: "At the meeting on November 14th, the experiment of transfusing blood of one dog into another was made before the Society by Mr. King and Mr. Thomas Coxe upon a little mastiff and a spaniel with very good success, the former bleeding to death, and the latter receiving the blood of the other, and emitting so much of his own as to make him capable of receiving that of the other." On November 21st, the spaniel "was produced and found very well." The experiment of transfusions of blood which occupied much of the attention of the Royal Society in its early days was revived within the last few years.

"November 16: This noon I met with Mr. Hooke, and he tells me the dog which was filled with another dog's blood, at the College the other day, is very well, and like to be so as ever, and doubts not its being found of great use to men; and so to Dr. Whistler, who dined with us at the tavern."

Several transfusions are reported by Denys in which from 5 to 10 ounces of the arterial blood of a lamb were usually taken. The first, a case showing condition of depletion from venesection, resulted in complete cure; the second, purely experimental, a perfectly healthy man agreeing to the trial: ten ounces of blood were removed from his vein and a similar amount from a lamb, injected into him. No disagreeable results were noted, and the man experienced an agreeable sensation of warmth. The third case was that of an insane man, 34 years old, escaped from a place of confinement, who was captured and transfused with five or six ounces of blood from a calf. A larger quantity was used a second time. Disapprobation of the Faculty of Paris discouraged further transfusions until early in the nineteenth century in France.

Lower, about the same time that Denys was working in France, was experimenting along the same line in England. His discoveries are reported in 1683, although as early as 1666 he had transfused the blood of three calves into three dogs. One of the dogs whose blood was withdrawn until he was extremely weak, recovered his strength instantly upon being supplied with blood from a calf.

Lower describes his method in detail as follows: "First take up the carotidal artery of the dog or other animal, whose blood is to be transfused into another of the same or different kind, and separate it from the nerve of the 8th pair, and lay it bare above an inch. Then make a strong ligature on the upper part of the artery not to be united again: But an inch below, viz. towards the heart, make another ligature of a running knot, which may be loosened or fastened as there shall be occasion. Having made these two knots, draw two threads under the artery between the two ligatures; and then open the artery, and put in a quill, and tie the artery upon the quill very fast by those two threads, and stop the quill with a stick. After this, make bare the jugular vein, in the other dog, about an inch and a half long: and at each end make a ligature with a running knot, and in the space between the two running knots draw under the vein two threads as in the other: Then make an incision in the vein, and put into it two quills, one into the descendent part of the vein, to receive the blood from the other dog, and carry it to the heart: and the other quill put into the other part of the jugular vein (which comes from the head) out of which, the second dog's own blood must run in the dishes. These two quills being put in and tied fast, stop them with a stick, till there be occasion to open them. All things being thus prepared, fasten the dogs on their sides towards one another so conveniently, that the quills may go into each other. After that unstop the quill that goes down into the first dog's jugular vein, and the other quill coming out of the other dog's artery; and by the help of two or three other quills, put into each other, according as there shall be occasion, insert them into one another. Then slip the running knots, and immediately the blood runs through the quills, as through an artery, very impetuously. And immediately, as the blood runs into the dog, unstop the other quills, coming out of the upper part of his jugular vein (a ligature being first made about his neck, or

else his other jugular vein being compressed by one's finger) and let his own blood run at the same time into dishes (not constantly, but according as you perceive him able to bear it) till the other dog begins to cry, and faint, and fall into convulsions, and at last die by his side. Then take out both quills out of the dog's jugular vein, and tie the running knot fast, and cut the vein asunder (which you may do without any harm to the dog, one jugular vein being sufficient to convey all the blood from the head and upper parts, by reason of a large anastomosis, whereby both the jugular veins meet the larynx). This done, sew up the skin, and dismiss him, and the dog will leap from the table, and shake himself, and run away as if nothing ailed him.

"Or, instead of a quill, take a small crooked pipe of silver or brass, so slender that one end may enter into a quill; and having at the other end, that is to enter into the vein and artery, a small knob, and for the better fastening them to it with a thread; for this is much more easy to be managed than a quill."

There is much interesting material in Dr. Lower's article. He reports, in one instance, the cure of a mangy dog in ten days after transfusions with blood from a healthy dog; in another, the transfusion of a dog for acute anemia following splenectomy with hemorrhage. Many transfusions were done from one species to another. He reports the transfusion of blood into human veins by Dr. Arthur Coga, November 23, 1667, when 7 ounces were withdrawn from the man, then by means of the Lower "pipe" joining was made to the artery of a sheep; transfusion continued for two minutes during which time about 9 or 10 ounces were transfused into the patient's veins. His condition was good during the operation and he afterward "found himself very well." He reports, also, experiments with noncoagulates, such as spirits of sal ammoniac. Dr. Lower died in 1691 and his experiments have been repeated by Sir Edmund King, Thomas Coxe, Gayant and Denys.

Previous to the Franco-Prussian war there was a long interval during which transfusion received almost no attention, having seemingly fallen into disrepute. At the time of this war, and afterward, transfusion was again attempted but finally given up. Between 1850 and 1875, however, many transfusion experiments were being carried on in the laboratory of Greifswald. In Hamburg Leisrink was working, also, with transfusion. The work in Greifswald was performed by Eulenburg and Landois. The latter devised an apparatus for direct transfusion by means of cannulas and tubing. In 1875 he published a monograph on "Die Transfusion des Blutes."

Dr. William Halsted gives us the first article in this country along this line. He reports several cases of carbon-monoxide poisoning treated by transfusion or refusion of blood. "Refusion of blood is literally a depletory transfusion in which the blood withdrawn is returned to the circulation of the loser." Dr. Halsted would first draw the blood, defibrinate it, and then reinject it into the patient. As to the best methods of infusing into the circulation good authorities disagree. There are four possible methods of infusion: centrifugally or centripetally into an artery or vein. Although to von Graefe is given the honor of being the first to draw attention to centrifugal arterial transfusion, Hueter deserves the credit of having introduced it to the profession and strongly advocated the method. His arguments for peripheral or centrifugal arterial transfusion are that the blood courses slower and more uniformly to the heart and the danger of phlebitis is avoided. Landois adds to these advantages, maintaining that the capillary system, like a supplementary filter, catches all foreign articles which may be present. Kümmel, Schede's assistant, produced gangrene of the hand by the centrifugal infusion of a saline solution into the radial artery.

The above arguments hold good for centripetal as well as centrifugal arterial transfusion. Dr. Halsted advocated the centripetal arterial infusion.

The syringe method of transfusion which we have been using for the past year was perfected by Lindeman. This method was first reported in 1892 by Prof. H. von Ziemssen, Director of the Medical Clinic in Munich, who at first injected whole blood subcutaneously, using from 300 to 450 cc. of blood at an injection, resulting in a very painful procedure. He used vigorous massage for fifteen minutes. Hemoglobin would be increased from 10 to 15 per cent. but he reports no fever and no hemoglobinuria in these cases. He then devised the syringe method. Following intravenous infusion he occasionally had rise of temperature and chill but in no case hemoglobinuria. No evidence of hemolysis or free hemoglobin ever were found in the blood serum; nor did he have phlebitis, or secondary thrombosis. He first raised the question of whether the often repeated transfusion in the bad progressive anemias might have a use, and suggests the possibility that, by repeated transfusions a real cure might result in some of these cases. He reports the case of a patient, a

woman, thirty-eight years old, whom he transfused seven times with marked benefit each time and raise of hemoglobin. As a result of experiments, he concluded that salt infusion was of benefit only for a short time.

The next great steps in this country were made chiefly in the simplification of the technic and making more sure of success in transferring a sufficient quantity of blood from the donor to the recipient. Carrel in his work (also Crile with his cannula) brought forth new interest along the line of direct successful end to end suture of blood vessels. Previous to this time, excepting in the work of Ziemssen, there was no certainty that the blood would enter the veins of the recipient. During recent years multitudes of cannulas and methods of suture have been devised which have eliminated the danger of clotting and subsequent embolism.

BRIEF REPORT OF SUTURES AND CANNULAS.

The success of Carrel depended upon the most rigid aseptic technic, the prevention of blood clotting in the wound or in the severed blood vessels during the operation by means of careful hemostasis and saline irrigation. His manual dexterity, fine needles and suture materials and exact approximation of intima and media were also important factors. Then came the Crile cannula with the principle of everting one vessel over a hollow cylinder and inserting this in the recipient vessel. In this method the intima coats are brought together and there are no raw surfaces. Following this there came a number of imitations with improvements, the best of these being the Elsberg cannula. Sauerbruch and Hartwell devised a method of slipping the ends of the artery directly into the end of the vein. This was fairly successful. Levin, Janeway, Soresi and McGrath have methods more or less similar, the vessels being everted over hollow cylinder, then brought together directly end on, by sliding the two parts on a little track or by the closing of a clamp.

In all these methods, however, there is considerable inconvenience to both donor and recipient. The amount of blood cannot be determined absolutely excepting, perhaps, by methods suggested by Libman and Ottenberg. Oftentimes the artery would go into a spasm from which it would not recover for half an hour or more, allowing a very small quantity of blood to pass through. This sometimes would be overcome by irrigations of hot salt solution.

Then come the indirect methods: the blood, while being transferred came into contact with the walls of the cannula, with a receptacle, with a needle or with the syringe. Dr. Lower performed the first in 1666; Denys the first from man to man, in France, by means of quills described elsewhere in this paper. About 1860, Landois used the rubber tubes. These methods were probably unsatisfactory. In 1909, Brewer and Leggett used simple glass tubes coated with paraffin extending from vessel of donor to vessel of recipient. This was a very good and efficient method. Pope modified it somewhat with a rubber tube between two glass cannulas. Bernheim used the silver cannula: one half fitting in the artery of the donor; the other in the vein of the recipient—one cannula then fits into the other, completing the connection.

BLOOD WITHDRAWN AND RE-INJECTED.

For the prevention of clotting, most methods depend on paraffin-coated receptacles, as of Curtis and David, 1911. Kimpton and Brown, Satterlee and Hooper and Percy, developed methods for measuring the blood and then re-injecting it. At first these were all without the addition of any foreign element. The best of these methods is apparently that devised by Kimpton and Brown as the blood can be withdrawn in one room and taken into another for injection into a recipient.

The syringe method marks the greatest advance that has been made in solving the technical difficulties of transfusion. It is so easy and so simple, without any inconvenience to either donor or recipient, that it is almost ideal. It is yet to be determined whether ultimately only one syringe or a number of them will be used. Ziemssen used a number of needles which were placed directly in the veins of the recipient and donor and he found that the needle could be stuck again into the vein at the same place. He advised at least three 25 cc. syringes and two or three assistants. The syringe was filled with blood withdrawn from donor and injected directly into the recipient. While this injection was being made, the second syringe was being filled. When the first syringe was emptied of its blood it was immediately washed out in normal salt solution by an assistant so that a continuous transfusion was going on. His average transfusion was from 200 to 300 cc.

Lindeman reported his elaboration of this method in 1913 before the New York Academy of Medicine, describing improved needles and the use of more syringes. Lindeman's revival was apparently a great advance.

Among recent devices reported in which but one syringe is used, may be noted the method of Watt, not reported, in Dr. Halsted's Clinic,

and of Kush, Bernheim, Cooley and Vaughan, and then later of Unger in New York. With the Unger apparatus, which is probably the best, a continuous injection of salt solution is made through the apparatus so that the blood does not have time to clot in it, while the syringe is kept cool by means of ether spray which also retards clotting. There is very little danger of any infection being carried from recipient to donor.

HERUDIN AND SODIUM CITRATE, PLASMAPHAERESIS METHODS.

At the same time work was being carried on to find a mechanical way of preventing clotting during transfusion, experiments were being performed on a chemical basis, for if the clotting could be prevented by a chemical, the difficulty of transfusion would immediately be solved. The two chemicals most used have been herudin and sodium citrate. The plasmaphaeresis method is the result of extensive work carried on by Dr. Abel of Baltimore and I have tried it in one patient with uremia. Blood was withdrawn from the patient into receptacles containing herudin. These receptacles were taken some distance to the laboratory. The red corpuscles were separated from the plasma then brought back to the operating room and re-injected into the patient in normal salt solution.

The herudin and sodium citrate methods are very successful and have the advantage that blood may be kept for some time, even four or five days, on ice and then be injected into the recipient. Satterlee and Hooper in New York, during 1914, reported favorably on the herudin method, while the sodium citrate method was reported by three workers almost simultaneously, early in 1915, the first being by Hustin, from Brussels, then in this country by Weil and then Lewisohn.

The objection first made was that the use of any drug to delay coagulation time would contraindicate the transfusion, as in a great many cases where transfusion is indicated, there is already bleeding with increased coagulation time. With exalate and citrate solutions the calcium of the blood is fixed and the calcium is a necessary factor in spontaneous coagulation. Continued use of the method, however, apparently has shown that the coagulation time of the recipient is not lengthened but is actually shortened. This is hard to explain.

Defibrinated Blood.—Undoubtedly the injection of defibrinated blood has saved lives and done a great deal of good. The reaction, however, with chill and high fever after its injection, as occurs in so many cases, would indicate that the method should be abolished, giving way to the very successful syringe and citrate methods.

The work of Dr. Halsted in 1882 and the work of Dr. Moss with defibrinated blood should not be forgotten. Dr. Halsted concluded from his work with the cases of gas poisoning that the depletion and not the refusion was the most beneficial.

HEMOLYSIS.

Without doubt transfusion would now have a far different standing in the world had there been only the mechanical difficulties of transfusion to be overcome. Discredit must repeatedly have been thrown on the procedure by the accidents due to hemolysis often accompanied by death. It was Landois who first showed that the serum of one animal may have the property of destroying the red blood cells in another. Hayem reported that in a transfusion from an ox to a dog, a serious condition resulted, resembling purpura hemorrhagica,death occurring in a few hours. He says "The effect of a foreign cell on the circulating blood is such that the latter immediately becomes finely clotted and carries the thousands of clots into the small vessels and one sees innumerable infarcts formed." We will not discuss in this paper the development of knowledge in this line nor the serological tests which have become so essential.

These laboratory tests fell into great disfavor about eight or nine years ago by men doing transfusion. It was the common saying that hemolysis or agglutination might occur *in vitro* but not *in vivo* and vice versa. I, too, assumed this attitude and while in New York good fortune was on my side and I had no serious accidents. Later, however, the great importance of these tests was fully apprehended and I will never again consent to do a transfusion except under the most extreme urgency without the reports on laboratory tests. I firmly believe now that such tests should be negative at the end of one hour, or if possible, a longer observation—never less. The earlier tests probably were not allowed to run long enough. Careful and accurate examinations eliminate all possibility of infection with any transmissible disease by transfusion.

Transfusion has been tried in the following types of cases: pernicious anemia, illuminating gas poisoning, exophthalmic goitre, hemophilia, toxemia, shock, hemorrhage, leukemia, septicemia, purpura hemorrhagica, malnutrition, endocarditis, intoxication, general debility, dysen-

tery, typhoid fever, infectious diseases, melena neonatorum, scarlet fever, pellagra, tuberculosis and tumors. It has also been used for vaccinating purposes. The best results have been obtained in the cases of hemophiliacs and babies with melena neonatorum; in the latter it is a specific and in the former it stops the bleeding immediately, although without curing the disease. It is beneficial in all anemias and may be still more beneficial in primary anemias with proper regulation. In shock it has been disappointing; this may be due to the fact that the condition has progressed too far before the transfusion is done. I would advise a very early transfusion in cases of shock. Transfusion is of the greatest benefit following acute and prolonged hemorrhages. For gas poisoning, bleeding is of great benefit as pointed out by Halsted. Depletion followed by injections of saline solution is as good, if not better, than transfusion. In tuberculosis there has been slight benefit and, so far, nothing has been accomplished in malignant diseases in the human by transfusion.

There is a great field still undeveloped along the line of vaccinating transfusion. My experiences in typhoid fever have been very successful. In cases of very ill typhoid patients, it would be most desirable to have a series of donors who recently have had typhoid fever. Very marked improvement followed transfusion with blood from a patient who previously had had typhoid fever, in the case of a patient depleted by hemorrhages as well as having a high grade toxemia; his temperature dropped to normal and the hemorrhage ceased, with a temporary disappearance of the toxemia.

The above is very suggestive of the good that might be accomplished by transfusing typhoid fever patients with blood from patients who have recently had the disease and who have probably high grade immunity. It would be extremely interesting to try this type of transfusion in patients with other diseases and perhaps be very beneficial to the patient.

NOTE: A fairly complete list of bibliographies, explanatory notes, etc. may be found in the paper "Transfusion of Blood: History, Methods, Dangers, Preliminary Tests, Present Status. Report of One Hundred and Fifty Transfusions" in the Johns Hopkins Bulletin, March, 1917 by R. D. McClure and George Robert Dunn.

REPORT OF TRANSFUSIONS.

We have done 150 transfusions for 80 patients, as shown in the following table:

Group of cases	Cases	Transfusions
1. Pernicious Anemia[1]	17	64
2. Secondary Anemia	19	23
3. Hemophilia	2	5
4. Shock	2	2
5. Hemorrhage	6	6
6. Leukemia	5	6
7. Intoxications	7	9
8. Septicemia	3	11
9. Dysentery	1	1
10. Typhoid Fever	4	6
11. Other Infections	5	5
12. Purpura Hemorrhagica	1	1
13. Benzol Poisoning	3	8
14. Tumors (Carcinoma)	5	5
	80	152
Not Successful (Early Days, Direct Method)	2	2
	Cases 78	Transfus 150

The transfusions which we were doing were, of course, more or less experimental. The field where transfusions are indicated is not definite as yet. We did 75 in pernicious anemia. In eight of these cases we did a splenectomy along with the transfusion. Some of those patients are living now, three years or more. What started us along this line was that we had some patients with benzol poisoning whom we transfused and they died. One patient's family insisted that we keep on transfusing. We were doing then blood vessel anastomosis transfusion. We did perhaps six transfusions on this one girl. At one time she was in coma. She recovered completely. In pernicious anemia you probably all have seen the marked benefit immediately after transfusion. And then after a time you will see that the patient gradually goes down hill again. If you transfuse repeatedly you can get the patient's hemoglobin up to 80 or 90 per cent. Then it is perfectly safe to take out the spleen. Then if you keep on with the transfusions you will notice a marked benefit. I feel that if you could take a pernicious anemia patient and get enough donors to keep the patient's blood over 80 per cent. after a few years one could cure pernicious anemia. I just had a letter from a man where the onset of the disease was three years ago. After three years he has had no remissions. He had about fifteen transfusions with several gallons of blood all told.

Another interesting field is the transfusion of people with acute diseases, typhoid fever patients, with blood of patients who have had the disease recently. Two years ago we had a medical student who was having very severe hemorrhages. We transfused him with the blood of a patient who had had typhoid fever six years before. His temperature immediately dropped

1. McClure, Roy D., M.D. Pernicious Anemia Treated by Splenectomy and Systematic Often-Repeated Transfusion of Blood. Transfusion in Benzol Poisoning. J. Am. M. Ass., Sept. 9, 1916.

and the hemorrhage stopped for three days. We did another transfusion and then his temperature went down and stayed normal. So it seems to me that there are great fields for transfusion, especially in this line.

DISCUSSION.

DR. JOHN W. CHURCHMAN:[2] I would like in this connection to mention a case which I think is absolutely unique in medical literature, showing what is a well-known danger of transfusion, and also showing the clinical proof of experimental work done some years ago in Europe. This patient was a pernicious anemia case brought to one of the largest university clinics in the east and transfused several times with great improvement. He was so much improved that he was to be sent home. Previous to the transfusion of blood in each instance, the blood had been tested out in the usual way for hemolysins and also the Wassermann reaction had been done. The final transfusion was done from his son, the blood being tested out for hemolysins but no Wassermann was done. The danger of the transmission of syphilis was explained to the son and he said that he had never had the disease. The patient improved after the transfusion and went home. About six weeks later he wrote to the hospital that he had had a peculiar rash and wanted to come up to see about. He was sent for and came up with a perfectly typical secondary syphilide. The son was then sent for and confessed that at the time the transfusion was done he had a primary luetic infection. So that you have here certainly the only human case of demonstrable transmission by the blood of lues, which, of course, comfirms the experimental work of Neisser on monkeys and illustrates, of course, that no chance should be taken in this respect. The rather amusing sequel of this story is that the son is now threatening to sue the Hospital for having given his father lues.

DR. NELLIS B. FOSTER: I am very much interested in Dr. McClure's paper and I am sure we are much indebted to him for coming here and giving it to us. Some of the early instances of transfusion were known to me. The one in Pepys's diary I remember of calling to the attention of an investigator in New York City and he hasn't spoken to me since. In a few pages later Pepys says that the dog is doing well. I was also interested that he brought up the early work of Dr. Halsted at the New York Hospital, the gas cases.

Then on the practical side I was particularly interested in what Dr. McClure has to say in regard to pernicious anemia because I think that we are, in clinical medicine, feeling more and more that that is about the only means which we have for the immediate treatment of such cases. They are in a certain sense, emergency cases and something must be done rather promptly if we expect to tide the patient over a critical period. In New York transfusion is coming more and more in vogue. We all felt a great deal of reserve about drawing deductions as to the ultimate utility of the method, but there was not much question as to the immediate utility. Here we are beginning to transfuse these cases. We have a peculiar problem in the way of finding donors and we have a little campaign going on now to try to get a number of healthy men in the town and get them grouped according to their tests and have them available to the clinic upon call; and, of course, in a small town like this, that is quite a problem. In the cases which I have seen transfused, only a very few have had the spleen removed, and I would like to ask Dr. McClure if in his experience he thinks that is a necessary part of the procedure in order to get the favorable results which he has noticed. Many cases in my experience have had a favorable outcome with splenectomy. Perhaps there was a favorable result in spite of the fact that the spleen in the majority of the cases was not removed. There was a feeling in the New York Hospital rather antagonistic to splenectomy in pernicious anemia. They did wholesale splenectomy in other cases.

DR. CYRENUS G. DARLING: In reference to transfusion in pernicious anemia, we had two cases in our clinic last year where transfusion was done and the spleen removed. Both of these cases left the Hospital apparently well. Of course, it is too short a time to say that they will remain well. In fact, they were turned over to the medical clinic for further observation and I suppose Dr. Foster has them under observation and will report the results later.

DR. CARL D. CAMP: I would like to ask a question as to what is the particular advantage of transfusion of blood over the injection of normal saline solution. I have seen, in cases of Asiatic cholera in Russia, a very marked benefit occur from intravenous injection of large quantities of normal saline, and I have heard, though I have never seen it, that the same beneficial effect was obtained in some cases of typhoid fever. The doctor's statement that possibly his blood transfusions acted by elimination of a toxin, would suggest that possibly a normal saline would do as well.

DR. MCCLURE: I will take the last question first. A good many of the cases were transfused in our series for hemorrhage, either hemophiliacs or bleeding in leukemia, or in benzol poisoning, and sometimes the hemoglobin was 14 or 15 per cent. The blood is so very thin and watery in such cases that I feel that the transfusion of the saline probably would not stop the hemorrhage. It is true that in those cases of great anemia the symptoms do not seem to be due to the lack of oxygen-carrying power as there is no cyanosis, but it seems that by transfusion you are replacing that which is missing, and if you can do that with blood, we feel that it is better than saline infusion.

As to splenectomy connected with transfusion in pernicious anemia, we have had eight cases. Some of those patients are dead. Those patients were not transfused systematically from the beginning. The patients which we have kept alive are the ones which we have followed carefully, and as soon as they showed any symptoms of a relapse, we had them come back to the hospital and we gave them systematic transfusion.

2. I am much interested in the remarks of Dr. Churchman, I believed that I had reported the first case of syphilis transmitted by transfusion of blood at the 1916 meeting of the American Medical Association. (See **Pernicious Anemia Treated by Splenectomy and Systematic, Often-Repeated Transfusions of Blood. Transfusion in Benzol Poisoning, by Roy D. McClure, M.D., Jour. Am. Med. Ass., Sept. 9, 1916, Vol. LXVII, pp. 793-796**). The circumstances in the case reported by me were very similar to those mentioned by Dr. Churchman.

RADIOGRAPHIC FINDINGS OF THE MONTH.

JAMES G. VAN ZWALUWENBURG, M.D.
(From the X-ray Clinic, University Hospital, Ann Arbor, Michigan.)

Case showing closing over the canal which carries the suboccipital nerve and the vertebral artery.

Case of osseous overgrowth on the back of the head. Two plates. Periosteal sarcomata.

Case of malignant psammoma of the frontal bone following trauma.

Case of brain tumor.

Case of correction of fracture of the neck of femur by driving in one nail. Bony ankylosis between the head of the femur and acetabulum, and motion about the nail as an axis.

Case of absence of spinous processes from the fourth lumbar to second sacral. Spina bifida.

Case of localized spondylitis, one side of the intervertebral disc with the formation of osteophytes on the lips. Typhoid spine.

Case of impacted fracture of the head of the humerus, treated for "rheumatism." Traumatic.

Case of old hypertrophic arthritis suing for damages. Not traumatic.

Case of "rheumatism" of the foot. Atrophic arthritis.

Case of abscess cavities in the mastoid processes.

Two cases of foreign bodies in the knee joint.

Case of inoperable carcinoma of the stomach without symptoms.

Case of perforating ulcer on the lesser curvature of the stomach.

Case of hepatic flexure, snared off by adhesions simulating diverticulum.

Case of man with four attacks of renal colic. Loss of weight. Very few gastric symptoms. Stomach shows persistent defect in the greater curvature. Possibly an extragastric mass beginning to infiltrate the stomach, possibly hypernephroma. (On exploration, carcinoma of left lobe of liver).

Case of enormous dilatation of the heart.

Case of aneurism.

Case of nursing mother with clinical tuberculosis of the breast. Clinical examination of the thorax negative. Undoubted tuberculous process radiographically.

Case of hard tumor of the neck showing two large masses within the thorax. Probably metastatic malignancy, either sarcoma, carcinoma of the kidney or thyroid. Man has kidney symptoms. Probably hypernephroma with metastases.

Three plates showing hyperemia in the lung. *(See notes.)

Case of unerupted canine tooth.

*These three plates are of exceptional interest in demonstrating the importance of the vascular component of the bronchovascular tree. The first plate was taken immediately after the first symptoms (pleural pain) arose, and demonstrated very clearly stereoscopically an exaggeration of the "bronchial tree" over a wedge shaped area, with the base at the pleural margin and the apex at the hilus in the mid thorax. The remainder of the "bronchial tree" appeared everywhere normal. In our notes on the case, it was assumed that these shadows were due to active dilatation of the pulmonary vessels, and in the absence of distinct indications of pleural disease, it was assumed that they were the first signs of a pneumonia. It seemed improbable that so distinct an alteration should result from anything but rather extensive parenchymatous infection.

The second plate was made about a week later and now demonstrated the presence of moderate sized effusion in the pleura, naturally in the lower portion but the region under suspicion was more or less obscured by the secondary processes, effusion and the compression.

The third plate after the recovery of the patient shows the entire disappearance of all evidence of effusion and of all evidence of vascular dilatation. To our mind this confirms the conclusions we have already previously reached with respect to the importance of blood volume in the shadow which is cast by the lung, and we believe that more careful attention to this phenomenon will sometime lead to the possibility of differentiation between increases in the bronchial tree due to peribronchial thickening or infiltration and vascular conditions, and even to the differentiation of the type of vascular reaction in a given area.

This problem has a distinct bearing on the diagnosis of early tuberculosis in which it not infrequently happens that the only demonstrable change is an increase in the development of the bronchovascular tree in either one or the other of the apices. It has usually been held that this is due to a tuberculous infiltration of the perivascular lymphatic structures of the lung tissue. It is difficult to harmonize this conception of the pathology with the observation that these shadows not infrequently clear up with the improvement of the patient. We think it much more likely that they represent the vascular reaction to the infection in the territory supplied by these vessels.

TRANSACTIONS

OF THE

Clinical Society of the University of Michigan

Stated Meeting, February 7, 1917

The President, CARL D. CAMP, M.D., in the Chair
Reported by REUBEN PETERSON, M.D., Secretary

TREATMENT OF CHRONIC NEPHRITIS.

NELLIS B. FOSTER, M.D.

(From the Clinic of Internal Medicine, University Hospital, Ann Arbor, Michigan.)

The principles underlying the treatment and management of chronic disease are not those which make a strong appeal with acute disorders. There is no dramatic element in a stubborn long-drawn-out battle with an adversary that invariably claims the field. But that the inevitable can be postponed, in some instances for years, by scientific and persistent care, is no little thing and that sort of fight has its attraction for not a few of us.

It is only by chance now and then that we have opportunities of studying the early stages of chronic progressive diseases such as is exemplified by chronic nephritis. At these times there are no symptoms and perhaps no evidences of disease except those disclosed by functional tests. The life insurance companies discover some of these cases and the very pertinent question then arises: what can we do to check the progress of the malady? This brings up the question of etiology and we know so very little about it, but in my opinion this type of case should always be investigated for some kind of infection. It is well recognized, yet often forgotten, that syphilis may give no intimation other than renal disease and I am convinced that by the discovery of a latent syphilitic infection followed by treatment for it some of my patients have been rescued from irreparable, frank nephritis. A second source of injury we are not likely to forget during the present furor over focal infection. Acute nephritis is not a rare sequel to follicular tonsillitis and no strain on the credulity is required to believe that chronic infections of the tonsils or elsewhere may give origin to renal diseases.

These foci, when discovered, should be treated radically, as much so when associated with nephritis as with arthritis. I can not attempt a complete résumé of infections but I have sketched the principle we must follow with these incipient cases. One must not forget metallic poisons and the chemicals so largely employed in the arts; nor the fact that renal calculus is more common than our figures show and that a stone in one kidney induces degenerative changes in both.

The early cases of nephritis are, however, but exceptions, the vast majority are well advanced into the stage of subjective symptoms of disease before a physician is consulted. Now the manifestations of nephritis are diverse enough so that difficulty in recognizing some of the pictures is common.[1] For example, a patient presents symptoms and signs referable to cardiac incompetency—dyspnea, edema, and a mitral systolic murmur. The blood pressure may be within normal bounds and if there be albumin and casts in the urine it is as well explained by passive congestion as by nephritis. These cases are treated for the cardiac disorder, quite properly perhaps, but unless one is vigilant and notes changes frequently an important fact will escape; namely, as the patient improves and the symptoms of cardiac disorder disappear, the blood pressure gradually rises until it often happens, when the attack is over, we find a blood pressure of 120-130 diastolic and 180 systolic. What has happened is very simple to explain. Chronic nephritis of one type induces a high blood pressure, to meet which the heart hypertrophies. Then a time comes when some myocardial change occurs and the heart dilates, resulting in the symptoms enumerated and with the dilatation, of course, the blood

1. Many cases of cardio-renal disease are sent to this clinic for goiter operation. The symptoms are misinterpreted as due to simple goiter.

pressure falls to the figure which deceived us in the beginning. These cases are very common. An increased blood pressure, systolic or diastolic, or both, usually means kidney disease. The pure arteriosclerotic type is exceptional and insufficiently demonstrated.

This brings me to certain matters which I must discuss before I can explain rational therapeutic procedures in nephritis.

In a period not yet remote the study of a case of nephritis consisted in an endeavor to arrive at an anatomic diagnosis. Was a given case one of tubular nephritis, glomerulonephritis, or any of the half dozen types of pathologic change described by the morbid anatomist? Now these anatomic changes have a significance to those who are studying structural change. They are useful and necessary, but for us clinicians a structural change, diagnosed ever so correctly, is absolutely useless until we can translate its significance into terms of function. And when one has studied many kidneys under the microscope it becomes increasingly evident that in different areas of the same kidney the type of lesion varies; here the glomerules chiefly have suffered, there the tubules; and with experience one learns that all types of lesion may be found in the same kidney, if one but hunts long enough. And then too, who can say that because a cell looks normal, its function was normal? It is not rare to find at autopsy, where death was due to some disease other than nephritis, kidneys damaged and atrophied to a degree seemingly incompatible with life. Is it not clear then that what the clinician needs to know with respect to any case is not a picture of the kidney structure, but rather a knowledge of the kidney function—in what respect and to what degree is the kidney function below normal? Investigations bearing on this field are being pursued in many hospitals and laboratories at present. The normal function of the kidney is to excrete certain nitrogenous waste products, salts and water, hence defects in function mean defective excretion of some one or all of these substances. And with any individual case it is requisite for us to know with which substance the kidney has difficulty and how serious the difficulty is before we are in a position to begin treatment. At present we recognize three types of defective function in renal disease.

(1) Nephritis with salt retention.

(2) Nephritis with nitrogen retention.

(3) Nephritis of a mixed type, i. e., both salt and nitrogen retention.

This classification is purely physiologic and gives no reference to the structural anatomy. That may be added, however, if one becomes convinced as to the nature of the anatomic change present. It is evident then, I think, that if we can recognize these types of perverted function which I have enumerated we are in a position to institute a protective therapeutic regimen. Conversely it is absurd and probably injurious to exact measures not required, as, for example, restricting a nephritic patient to minimal amounts of salt when there is no defect in salt metabolism. Hence we must know just exactly what we are doing if good results are expected. In the hospital we have formed the habit, begun as an investigation, of testing out each patient with respect to the nitrogen, salt, and water metabolism, much in the way a diabetic is studied for carbohydrate tolerance. The degree of study is possible only in well organized clinics and I think that we now have sufficient information as to certain essential facts so that we can use more direct methods to learn what is requisite in a case study. With each case of nephritis we need to know, as I have pointed out: is there defective metabolism of salt, of nitrogen, of water? In the first place if there be edema and if the heart is beyond suspicion one is justified in concluding that salt and water are handled in an abnormal manner. If there is also a high blood pressure the probability is that nitrogen waste also is being retained in blood and tissues. When there is no edema, a high blood pressure and a low phenol-sulphone-phthalein excretion indicate nitrogen retention. If means are at hand the nitrogen retention can be demonstrated by determining the urea or nonprotein nitrogen of the blood and with edema probably a single twenty-four hour collection of urine would show a sodium chloroid content so low that it would be confirmatory. In the course of rather elaborate studies both in the wards and laboratory I have had charts kept of the results of the various examinations and correlated these findings with the metabolism studies of the same patients. A considerable number of cases have been so studied and these rather significant points seem to result. A schematic arrangement facilitates clarity.

Edema + ***retinal edema*** indicates *chlorid* retention.

Edema + ***low phthalein index*** indicates *chlorid* retention.

Elevated blood pressure + ***retinitis*** indicates *nitrogen* retention.

Elevated blood pressure + low phthalein index indicates *nitrogen* retention.

Elevated blood pressure + edema indicates *chlorid* and (probably) *nitrogen* retention.

Elevated blood pressure + edema + low phthalein index indicates *chlorid* and *nitrogen* retention.

These are frankly only probabilities and there are exceptions, and with our present knowledge I know of no way to attain definite facts except by use of laboratory methods. Defective excretion of sodium chlorid is easily demonstrated if a diet of known salt content be given and the urinary chlorid estimated. Nitrogen retention can be shown readily by a quantitative analysis of the blood for either urea, or total nonprotein nitrogen; or possibly, for creatinine alone. These methods require, however, the laboratory and the services of a competent chemist.

After having found out what type of physiologic defect a given case represents the principle of treatment is to protect that weakened function. The same principle we employ with cardiac decompensation; namely to lighten so far as possible the work of the heart by imposing complete rest. Let me take up first nephritis with chlorid retention and for clarity and definiteness cite one case as an example. Case 77 was a man 32 years of age, who complained of a gradual loss of strength for a year; some swelling of his ankles in the beginning became more pronounced until he could not lace his shoes; for a month he had dyspnea on any exertion. His physician examined him and diagnosed nephritis and advised him to submit to a period of study. The examination showed slight general edema, most notable in the legs; no cardiac hypertrophy nor evidence of valvular defect; the blood pressure averaged 126 systolic and 70 diastolic. The retinae appeared normal. A twenty-four hour specimen of urine measured 740 c.c.; contained much albumin and many casts. On a diet containing 8 grams of salt his average excretion for three days was 6.1+ grams (18.5 grams in three days), thereby retaining 5.5 grams of salt in the period ($24 - 18.5 = 5.5$). A phthalein estimation showed 52 per cent. recovered. Blood analyses gave normal figures for the nonprotein nitrogen. In brief, the case was one of the chlorid retention type without notable disturbance in nitrogen excretion. By analogy with cardiac disease the rational procedure is to limit the amount of sodium chlorid ingested to within the amount the kidneys can excrete. In the case cited the salt taken should be not over five grams. In practice outside an institution it is easier to have for these cases a set diet which contains a minimal amount of salt. Such a diet may contain fruit, milk, cereals, sweet butter, and unsalted bread.

Breakfast:

Apple, baked or stewed
A cooked cereal (no salt added) with cream and sugar
Unsalted bread toasted, sweet butter
Caffein free coffee with cream.

Dinner:

Cream vegetable soup
Two eggs as omelette with tomato or onion
Unsalted bread and butter
Rice or tapioca pudding.

Supper:

Cereal with milk
Unsalted bread and butter
Stewed fruit.

A diet of this kind puts the demands on the kidney to excrete salt at the lowest possible level. With this method many patients show prompt improvement by diuresis and a rapid subsidence of edema. With others the improvement is slow and with some there is no visible betterment at all. Even when the edema clears up promptly and completely the persistent marked albuminuria is evidence that we are not treating the disease but only one of the consequences of the disease. But we have at least removed an overload and thereby given opportunity for diseased cells to become normal and tissue to regenerate. Nephritis with chlorid retention is apt to be a protracted and tedious disease. The malady has the ear-marks of a chronic intoxication and many at present are disposed to hold some type of infection responsible. To me it seems clear that the kidneys are not alone involved in the disorder but it happens that disturbed function with these organs more quickly induces visible signs.

When the immediate urgent symptoms have been removed or their intensity has diminished all of the cases of this type must be most carefully examined for evidences of infections. Foci are not always found, and sometimes when they are found and eradicated improvement does not ensue; yet occasionally such excellent results are secured that the chance can not be neglected. In brief, these cases with symptoms must be studied in the same way that one studies cases of simple albuminuria when no symptoms, such as edema, are present. The im-

portant consideration for the patient is the discovery of the cause of the trouble.

Before leaving this type of nephritis I wish to mention some methods of treatment that have gained an unearned favorable repute and first among these is perhaps the hot pack or sweat bath. In the first place we now know from careful measurement and analysis of sweat that the salt lost by nephritics in this way is very slight in amount. It is also questionable to say the least, whether it is advisable to abstract the water from edematous tissues and leave salt and other substances in them in the resulting higher concentration. And finally it has been recognized for a long time that free diaphoresis will with some cases induce uremic symptoms. With these considerations in mind the hot pack does not seem rational. Practically I have watched its use for years past and I have very seldom seen any improvement in a patient's condition except with cases where the heat induced diuresis. A hot compress over the kidney region will then produce the same result and is devoid of danger and does not subject the patient to a weakening and exhausting procedure.

The question of a diuretic arises at some time with every protracted case of edema. With nephritis diuretics that act on the kidney should be avoided. Their effect is due to irritation and the renal tissue is already sufficiently irritated. When the edema is due to cardiac disease then at times diuretics are of some value, perhaps, and may possibly increase the effect of digitalis; but with pure renal disease their use is not rational and I believe not practical.

Chronic nephritis of the type associated with nitrogen retention is one of the common diseases. Directly or indirectly this disease ranks among the chief causes of death in this country as shown by the mortality statistics. A very large percentage of all cases of high blood pressure are essentially cases of renal disease. Although some cases of hypertension do not develop characteristic signs of nephritis and a very few of these cases do not show nephritis at autopsy, yet this is exceptional and the fact remains that unexplained hypertension is probably nephritic in origin. An explanation of the physiology of this phenomenon is yet wanting. But because it is so frequently associated with nephritis, often the first notable sign, and is of itself directly responsible for several morbid states it requires some special comment in this place. The burden thrown upon the heart by a blood pressure persisting from twenty to forty millimeters of mercury above the normal is quite obvious, and when one considers the tendency to myocardial degeneration in association with renal and arterial disease, cardiac dilatation and its train of symptoms is explained. Likewise cerebral hemorrhage needs no comment. Obviously, then, hypertension in itself may be no insignificant menace. The only method of control which has met with any degree of success in my experience involves a complete revision and rearrangement of the life and habits of the patient. Which factor is of most importance I do not know. A marked reduction of diet is indispensible; so is a curtailment of business activity. Some adjustment of the rigor of exactions may be made for the needs of the patient but as a rule the dietary should be the lowest compatible with health maintenance, and it is remarkable how little food is required by adults past the prime of life, and how easily the patient fits himself to the restrictions provided the physician sees to it that all foods that especially entice the appetite are crossed off the list, two small meals a day, a very low protein intake—forty grams at most. The next consideration is a readjustment in fields of activity so that responsibilities and worries are unloaded. This is most important with men who are actively engaged in large affairs. And finally a surplus of rest in bed, by which is meant considerable over the conventional eight hours out of the twenty-four. This is a considerable requirement to demand of a patient but the remedy is for a desperate disorder and the sense of well being attained is ample recompense. With some cases the fall in blood pressure and coincident improvement in health following these restrictions is remarkable. With advanced cases a benefit can usually be secured although a normal blood pressure is seldom attained.

It is perhaps well to explain what is meant by nitrogen retention. Essentially it is simply failure of excretion of nitrogen. If a normal adult take ten grams of nitrogen daily in his food he will be found to excrete the same amount—that is to say he is in nitrogenous equilibrium. Every healthy adult tends to be in this state. During the period of growth less nitrogen is excreted than is ingested, the difference being retained for the construction of new body tissue; the same is true during convalescence after wasting disease such as typhoid. But with these two exceptions—adolescence and convalescence—the retention of nitrogen indicates kidney disease and the retained nitrogen

can be detected as an excess of urea and other urinary bodies in the blood and tissues as Bright pointed out. The failure of excretion of the products of metabolism is attended by symptoms and it would be in accord with general biologic laws if it were proved that excretory substances are injurious to the organic tissues.

The first principle in the treatment of this type of nephritis is evident from the foregoing considerations. The amount of nitrogen waste to be excreted must be reduced and the only way to secure that end is reduction of the protein food taken in. A low protein diet that we have used consists of a daily allowance of one pint of milk, four slices of bread, two potatoes, rice, green vegetables, butter, fruit and sugar. This diet taken in ordinary quantities will approximate forty-five grams of protein daily (seven to eight grams of nitrogen). With very sick patients it is too much and should be reduced.

The second principle in treatment depends upon the "failure or concentration" so called. The low specific gravity of the urine in typical cases of advanced nephritis is familiar. An earlier and more general manifestation relates to the nitrogen percentage. Whereas with normal persons the kidney is able to excrete urine containing 2 per cent. of nitrogen with ease, with nephritics of this type the urine may not contain over 0.5 per cent. of nitrogen. Now what does this mean? The average normal person excretes daily about 1200 c. c. containing 1.5 per cent. of nitrogen or eighteen grams. A nephritic taking the same food can not excrete a urine of higher concentration than 0.6 per cent., let us say. Then if his urine volume is 2000 c. c. he excretes but twelve grams of nitrogen—a nitrogen retention of six grams. It is evident that he must put out 3000 c. c. of urine daily if he is to get rid of all his nitrogen waste.

1200 c. c. x 1.5% = 18 g.
2000 c. c. x 0.6% = 12 g. (6 g. + bal.)
3000 c. c. x 0.6% = 18 g.

In a series of metabolic experiments it was demonstrated in my clinical laboratory, that retention could be produced at will with nephritics by changing the volume of water drunk.[2] This gives us the next principle in treatment —namely give large amounts of water and relieve the diseased kidney of the burden of concentration. In practice some pleasant beverage is usually better taken than water; lemonade answers the requirements. It is best when commencing this treatment to give two liters of fluid a day, two days, and collect and measure the urine each day in order to find out whether water is well excreted. If water is excreted freely than gradually increase the fluid intake up to three or even four liters per day. Now we must not lose sight of an essential fact in this procedure, namely that the burden of the disordered function is being transferred to the heart. Pumping this extra water through the circulation means foot-pounds of extra work and occasionally edema develops as a result of cardiac insufficiency. With a majority of cases where edema resulted from this "forced fluid" method of treatment a correction of this symptom can be effected by the use of digitalis. With some cases, on the other hand, it becomes evident during the first two days that water is not well excreted; there is little or no increase of urine volume in response to increased intake of water. One should then try the effect of "drink days"—two or three days a week when the intake is considerably augmented. This plan permits of excretion of the excess of water during the interval days when the intake is less. A moderate amount of edema, however, is not to be regarded as a sufficient reason for reduction in water ingest. By contrast with the sequelae of marked nitrogen retention edema is relatively insignificant.

The principles already outlined point the way in the treatment of mixed types of nephritis and further discussion is unnecessary.

2. Amer. Journ. Med. Sciences, 1916.

REPORT OF TWO CASES OF PULMONARY TUBERCULOSIS PRESENTING CERTAIN POSSIBLE ERRORS IN DIAGNOSIS.

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There is nothing at all unusual about either of these two cases. In fact, it is because they are rather common that I wish to call your attention to them. They represent certain errors in diagnosis that I think are worth reviewing. The first is a case of a young man who insisted that he had lung trouble. He was repeatedly examined and assured by a number of competent men that there was nothing to be found on physical examination, and if you were to examine this patient, I am sure you would agree to those findings. However, a review of the history of the case gives one the diagnosis. There was a history of night

sweats and of hemorrhage about a year or two previous to the time he presented himself for examination. The X-ray plates show extensive fibroid infiltration particularly on the left. This might be expected to give diminution of resonance but there is sufficient compensatory emphysema to give good resonance. There were no signs of active tuberculosis, no râles to be heard at any point over the chest and the percussion note was the same on both sides. While the extent of the excursion of both sides might have been somewhat diminished, yet the lungs themselves were rather voluminous so that the man presented a chest of fair size and shape. This is a mistake that is very commonly made and I would call attention to it not because the diagnosis is so difficult when the case is carefully studied, but because of the fact that the physical signs failed to reveal the process.

The other case is one in which a diagnosis of tuberculosis had been made by two or three observers on the physical signs. The patient was a young woman and in a routine examination she was told that she had an apical lesion in the right apex which extended well below the right clavicle. This diagnosis was made because of a rather intense bronchovesicular breathing over that area. There were no râles so the patient was told that the condition was latent but that she should be careful about her mode of life in the future. In this case the history failed to reveal anything suggesting tuberculosis. She was very slight in build, of neurasthenic temperament with gastric disturbances which led her to reduce her diet to a minimum as the result of which she had been below weight for a number of years. Her only complaint was weakness and exhaustion occurring after a very ordinary amount of work.

The error occurred here through failure to make a comparison between the apices. On listening to the left apex a very loud vesicular breathing was heard and below the clavicle it was almost bronchovesicular. On the right it was so intense that if that apex were examined alone it would certainly suggest a lesion.

I am presenting the X-ray plates of both cases but not as a final proof of the diagnosis for in each instance I think the diagnosis could have been arrived at by a careful scrutiny of the history and physical signs.

DISCUSSION.

DR. JAMES G. VANZWALUWENBURG: This is a subject that lies fairly close to my heart. I see many of such cases in which there is a difference of opinion between different consultants, and which, as I think, are finally correctly interpreted when they come to the X-ray room. I have become very skeptical of the physical findings unless I am fairly certain that the man who has made the physical examination is an expert, and often an expert will go wrong. My attitude has been that I can only add my data to that of the others, but none the less, I believe the X-ray evidence should be taken with a little more weight in many cases. These two cases under discussion of course are outstanding cases where the diagnosis could have been arrived at by more careful, thorough clinical examination. But there is a class of cases repeatedly coming to me, often merely to satisfy the patient's own curiosity, that have definite radiographic signs in which no clinical signs can be elicited. Most of these patients are told "It probably does not amount to much if there is anything there at all," and they are not diagnosed as tuberculosis. I think it is more consistent to classify these as tuberculosis than what was done seven or eight years ago when one of the men in this school made a report on a large series of cases of incipient tuberculosis in which a year and a half later a relatively large number had recovered. I am perfectly satisfied that a number of these patients had no tuberculosis. I have repeatedly shown in this Society radiograms of people in whom the diagnosis was only made by the radiograph, so that I think I need say no more.

TRANSPLANTATION OF THYROID TISSUE.

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The obvious value of the successful transplantation of thyroid tissue into cases of cretinism and myxedema has been the basis of my experimentation along these lines.

There are in the literature records of many experimental thyroid transplantations not only in mammalians such as dogs, guinea pigs, rats, mice, cats, sheep, pigs and rabbits, but amphibians, fish, birds and mollusks as well. Some investigators have attempted to transplant thyroid and other glands of internal secretion from one species to another of the same order, and even into species of a different order, but none of such experiments has been uniformly successful. The only attempt at transplanting tissue from a frog into a man that is reported as successful was that of transplanting epithelium from the frog's dorsum into the arm of a man. Even here the epithelization may have taken place in spite of the transplanted frog epithelium. The transplants extensively used are the autoplastic and homeoplastic or iso-transplantations. The sites chosen to transplant thyroid tissue have been quite numerous.

Stich and Mattas transplanted thyroid gland by means of blood vessel sutures in dogs and

succeeded in three cases out of ten in autoplastic grafts. Cristiani transplanted into the subcutaneous tissue such as the ear of rabbits, as this method permits better observation because of the size, transparency and vascularization of the graft. (1894-1906.) Salzer prefers intramuscular transplantation into the abdominal wall. Seman and Kocher in 1908 transplanted thyroid into the diaphysis of the femur. Payr transplanted thyroid into the spleen in 1906. He selected it because "the spleen possesses, thanks to its altogether peculiar and rich blood supply, unusually excellent conditions for transplantation of all kinds of tissue." The circulation is rapidly restored, a relatively small proportion of the transplanted part is sacrificed to central necrosis, and the processes of regeneration are more active and more extensive than in any of the methods of transplantation heretofore employed. The chief argument against transplantation into the spleen is the danger of hemorrhage. Chief among technical features are the use of the transplanted organ as a wedge into the splenic wound and of the omentum as a support for the stitches and a covering for the line of incision in the spleen. By this method Payr was able to keep splenic transplantations alive as long as 300 days. Homeoplastic transplantation of thyroid in man has been tried with very little success.

Payr was able to transplant successfully thyroid tissue from a perfectly healthy mother into the spleen of a totally imbecile child six years of age with severe infantile myxedema which had been treated by feeding thyroid for a period of three and one-half years without effect. The result somatically as well as intellectually was highly satisfactory. W. E. H. Groves and Cecil Joll report in the *British Medical Journal,* December 24, 1910, an interesting case of exophthalmic goitre treated surgically by two operations. Since there was very little thyroid and parathyroid tissue left after the second operation, symptoms of tetany appeared which were relieved by ingestion of thyroid gland. Marked improvement was noticed after grafting a piece of thyroid together with parathyroids from another patient. However, the iso-transplantation or homeotransplantation of thyroid in the hands of many workers has been uniformly unsuccessful. Stich and Mattas transplanted thyroid by means of blood vessel suture in all their homeoplastic cases, but the grafts did not take.

Hesselburg noted that both homeo and autografts undergo certain changes. At first both show central necrosis, the colloid substance diffusing through the surrounding tissue, the acini collapsing while the secreting cells of the autograft rejuvenate. Colloid is secreted in the acini and function is normal in ten or twelve days. Homeografts, on the other hand, do not regenerate; lymphocytes and leucocytes collect about the graft forming a barrier for nourishment, and many of the leucocytes carry away the dead cells of the isograft. The young fibroblasts destroy the foreign bit of tissue, apparently acting like osteoclasts in the osteogenic process in long bones.

In 1911 E. A. Smith of London made the assertion that "no successful case of homeoplastic transplantation of thyroid glands by vessel suture method had yet been reported. Several cases of homeoplastic transplantations in human surgery by methods other than vessel suture have been reported, but one proof is wanting in all, namely a subsequent removal and microscopic examination of the graft."

The non-success in isoplastic transplantation of thyroid gland is, I believe, due to the chemical differences in the tissues of the same species. It is a well known fact that hemolysins, precipitins and agglutinins are formed on injecting the blood of one animal into another of the same species and no doubt cytolysins and isolysins are formed. Usually, however, powerful products of this nature are not found in the blood of species of the same order, indicating that the biochemic conditions in animals of the same species are not very dissimilar. It is plausible that in a small percentage of cases of transplantation of tissues into animals of the same species very little isolysin will be produced, making the homeoplastic transplantation or isotransplantation of highly organized tissue possible. At the present time when transfusion of blood is to be performed the blood of the donor and the recipient is tested for hemolysins. I believe that in cases of transplantation of thyroid from one individual to another, the blood or humors ought to be similarly tested for isolysins. This is a feature that to my knowledge has not been worked up.

The success of transplantation of thyroid whether autoplastic or homeoplastic depends on the following factors:

1. There must be perfect asepsis in technic.
2. The transfer must be rapid.
3. There must be minimum manipulation of the transplanted tissue and the recipient organ, and crushing of the gland should be avoided.

4. In case of transplantation into spleen, hemostasis is essential.

5. Deficiency must be created greater than one-half the total internal secretion of the gland transplanted in order that the autotransplants may "take," grow and functionate. (Halsted).

6. In case of homeoplastic transplantation of thyroid it must be determined beforehand that no isolysin will be produced in the humors of the recipient through the blood of the donor.

My first experiment was an attempt at transplantation into the diaphysis of a long bone after the Kocher method.

November 2, 1915, under ether anesthesia, the right hind leg of a dog weighing 25 pounds, was prepared. The usual precautions were taken for asepsis and an incision was made over the anterolateral surface of the left tibia. The skin was retracted and the periosteum incised and elevated. A cavity was chiseled into the marrow about one inch long and half an inch wide, and a silver ball about the size of a large pea was placed in it. The periosteum was sutured with linen thread and the wound closed in the usual manner. The dog was under the anesthetic about three-quarters of an hour and reacted well. A plaster dressing was applied to the leg of the dog in order to keep the wound aseptic but was not effective. The silver ball was lost and the dog developed traumatic osteomyelitis. We gave up this method because of infection which was easily introduced into the wound on account of its shallowness and accessibility to the animal's tongue. Later thyroid tissue was transplanted into the spleens of three dogs, two of which were prematurely killed in my absence. However, both dogs were healthy and did not show any signs of strumiprival myxedema four to six weeks after operation.

The third case was that of a female dog weighing about 25 pounds, operated under ether anesthesia January 19, 1916. A collar incision was made around the neck and the left lobe of the thyroid removed in its entirety. There was no other lobe of thyroid found on either side of the trachea. A left rectus incision was made and the spleen delivered through the opening. Two incisions were made into the spleen, a perpendicular one at the upper pole about two inches long and a horizontal one at the lower pole about the same length, both incisions resembling a pocket. Then two slices of thyroid tissue removed a few minutes previously, one-sixteenth to one-eighth of an inch in thickness and about the size of a quarter, were placed into these two incisions in the spleen. Hemorrhage was controlled by darning the spleen with two mattress sutures of silk thread. The wound was closed in the usual manner. February 17, 1916, the dog was still alive and doing well. No symptoms of cachexia thyreopriva were noticed. At no time did the dog show any symptoms indicating deficiency of internal

Fig. 1. Section of thyroid transplanted into the spleen. Low magnification. Thyroid tissue in the center with colloid in the acini. There is suggestion of capsule formation.

(Fig. 2. Section of thyroid transplanted into the spleen. (High magnification). One can see the cuboidal cells without basement membrane characteristic of thyroid tissue.

secretion of thyroid gland. Aseptic precautions, thanks to the skilful assistance of Mr. Wm. Gonne, were throughout perfect. The neck and laparotomy wounds healed per primam so that after about ninety days junior medical students being unaware, opened the abdomen of the dog

for other experimental work. The spleen was secured at this time and showed two small omental adhesions, being otherwise normal. Sections of the spleen were made at the Pathological Laboratory and pronounced by Dr. Warthin to be functionating thyroid transplantations. The dog maintained its nutritional equilibrium because as Halsted says, only a small portion of secreting gland is sufficient to supply the body demand. The sections of both pieces of the transplanted portion of the tissue (Figs. 1 and 2) show acini filled with colloid, polygonal cells, which have the granules characteristic of thyroid, with no basement membrane present. There is a suggestion of capsule formation from the young fibroblasts.

RELATION BETWEEN ACHLOROHYDRIA AND ACHYLIA.

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What I have to say will hardly be dignified enough to be called a paper. I wish merely to bring forth a few facts concerning the physiology of the stomach and a few facts relating to deficiency of the secretion and the methods by which we are now studying those conditions.

The three things of major importance that normally occur in appreciable quantities in the stomach, are the acid and the enzymes, rennin and pepsin. The acid normally in stomachs is considered to be free and combined hydrochloric acid. The quantity of acid present is usually given as 0.2 to 0.25 per cent. hydrochloric acid. Strictly speaking that is not so. The acid content of the gastric juice is much higher than that figure. If we get pure gastric juice which has been obtained chiefly in dogs with the Pawlow pouches, as has been done by Pawlow, Foster and Lambert, Carlson and others, we find that the percentage is higher. Carlson's work has the advantage in that most of his experiments were done on human subjects. He worked with two men who had gastrostomies performed and he was able to make some 300 observations on these two individuals both as to the composition of the gastric secretion and some of the other factors of gastric physiology. In the dog experiments, and in the observations of Carlson, the gastric juice acidity instead of being .2 per cent. is more nearly 0.5 per cent. The reason that acid, as we titrate it in the laboratory, is lower than that figure is due to two or three factors. The material we recover for examination is not pure gastric juice. We have the addition of saliva, changes of food in the stomach, dilution of fluids and by far the largest factor is the regurgitation of alkaline material from the duodenum back into the stomach. It is believed that the acidity of the stomach is never greater than the normal acidity that glands are able to secrete. There is some individual variation in this. Then the conditions wherein we get hyperacidity are really due to changes in the factors which tend to reduce the acidity rather than an increased secretion of hydrochloric acid, although in certain ulcerative conditions there may be a hypersecretion.

The other two things which we are concerned with are pepsin and rennin, more especially pepsin which is present as pepsinogen. True pepsin is capable of acting upon acid proteins. Therefore, by the action of pepsin we get the first cleavage products of proteins. There is another factor in which hydrochloric acid has been supposed to play a part which should be mentioned here. That is the action of hydrochloric acid in controlling the pyloric sphincter. We know that in conditions where we have no free hydrochloric acid in the stomach, that the stomachs of such patients as a rule empty very rapidly on a test meal. We know, on the other hand, that individuals who have a definite clinical hyperacidity have a moderate retention when there is no other pathology which we can demonstrate except the increased acidity. Cannon thought that he was able to demonstrate conclusively that hydrochloric acid by a delicate balanced mechanism regulated the pyloric sphincter. The acid on the stomach side stimulates the pylorus to open, while the acid stimulating the duodenal side causes the pylorus to close. When the acid on the duodenal side is neutralized by the secretions from the pancreas and the bile, the contraction is lessened and we have a relaxation from the duodenal side and stimulation from the gastric side and the pylorus opens. There are a great many physiologists who now believe that this is not by any means the whole story and that the regulatory mechanism is largely a nervous one.

By achlorohydria we mean a total absence of free hydrochloric acid in the stomach. There may be some combined hydrochloric acid or organic acids. By achylia is meant a total absence of free hydrochloric acid in the stomach.

There may be some combined hydrochloric acid or organic acids. By achylia is meant a total absence not only of free hydrochloric acid but also of the active enzymes, pepsin and rennin. In the routine examination of stomachs with hypermotility with the regular stomach pump, it is almost impossible to recover small residues. For this purpose in these cases we are using a small tube which we use in the fractional determinations of stomach contents. It is impossible to obtain definite data of the pepsin or of the curve of hydrochloric acid secretion unless one examines the contents of the stomach at various periods during the digestive cycle. A number of years ago men attempted this by giving a test meal, say at 8 o'clock in the morning. Fifteen minutes later the contents were recovered and tested. The next morning a similar meal would be given, the stomach evacuated thirty minutes subsequent to ingestion, and a longer period was taken on subsequent mornings. From this a curve of secretion was plotted. There is another method, the so-called fractional method which has received considerable stimulus from workers in Philadelphia. The method is to insert a Rehfus tube having a small tip containing slots on the end which the patient swallows. This being heavy, seeks the dependent portion of the stomach and one can with a syringe draw out a small quantity of the gastric contents and examine it for the three essential constituents, and then at suitable periods obtain other fractions. A similar tube is used for the duodenal contents. We have used a tube of white rubber with a piece of lead placed in the end to give it weight, and like it better than either of the above described tubes. This tube is larger and stiffer than the others and can be easily inserted and is not too large to cause the patient discomfort.

In achlorohydria or achylia, we are concerned largely in several groups of patients, *first* those associated with chronic gastritis. And there is quite a distinctive group of individuals who have this condition. Very many chronic alcoholics fall into this cass. In this group common in the Medical Clinic are the railroad employees who have been in the habit of eating cold snacks on the run with no regularity. A second group is associated with malignant changes in the stomach, another large group of cases with a deficiency in secretion are secondary to cardiac and renal diseases. Then again there is a class with purely nervous, psychic achlorohydria and achylia. The group in which we are most interested are those who have a lack of secretion in severe anemias. We have started now a routine examination of all the patients who have a hypoacidity or achlorohydria, making complete charts on two successive days by examining with the fractional method. We have made thirteen or fourteen charts of patients with achlorohydria and in most of these where we have found achylorohydria, there would also be no pepsin present. The point of interest to us is, have these patients enough secretory tissue left in the stomach which under proper circumstances would secrete enough pepsin to perform the ordinary processes of digestion? Ordinarily it takes a small amount of pepsin if it is activated to digest an ordinary meal. Normally there is pepsin in excess in the stomach.

I wish to demonstrate several curves of secretion which we have charted. The first curve is from a man who has a true achylia gastrica. The free acid curve remains absolutely zero. During this time there was no pepsin present and the total acidity varied from 10 cc. of n/10 acid per 100 cc. of contents or one-sixth to one-seventh normal acidity up to 18 or 19, and remained level to the end.

The parallel curves were made after administering acid. The therapeutic dose of hydrochloric acid which we give ordinarily is 30 minims with the meal, a similar dose administered after the meal, and that is usually considered a good sized dose. In this case at the beginning of the experiment we gave 30 minims of dilute hydrochloric acid and one-half hour after the meal again a second 30 drops. With this dosage the free acid curve remained almost level, at about zero. The combined level went up to 40 and the pepsin curve remained zero except at the time where the total acidity went up to 40, there was one unit of pepsin whereas the normal individual has 200 to 250 units.

On the third day we gave the man the same meal and 30 drops of dilute acid. At twenty minutes we drew off a portion of the contents for examination. At that time free hydrochloric acid was zero, and combined 15. After withdrawing the fluid we injected five drops of concentrated hydrochloric acid in 10 cubic centimeters of water and twenty minutes later withdrew another sample, and repeated the strong acid. This was repeated until the stomach was empty. After we injected five drops of concentrated acid ten times during two hours and thirty minutes, the free hydrochloric acid curve went up at one time to a high normal

free hydrochloric acid. The lower curve represents the curve of pepsin secretion. There was no pepsin during the psychic secretory period, and an appreciable amount during the second hour.

The second is the curve taken from a pernicious anemia case. His first curve is not unlike the one from the first patient. With the therapeutic doses given there was a slight rise in the combined acid, although the free acid remained zero and there was no pepsin activity. He was given nine injections of the five drops of hydrochloric acid and his free curve went up as high as 36 and his total went up to about 50 at one point. Pepsin remained negative throughout.

DISCUSSION.

DR. JAMES G. VAN ZWALUWENBURG: This is all very interesting, and from the point of view of the relationship of the gastric and duodenal secretions, it is very much to the point. However, from my point of view, there is another element in the control of gastric secretion and in the control of the pyloric reflex which is not mentioned, namely, the so-called "ileocecal pyloric reflex." Of course, the principle that the discharge from the stomach is more or less controlled through nervous mechanism from the terminal ileum is hypothetical, but to the X-ray man it has come to be a very real thing. We see clinical evidence of that almost every day and it offers a fairly satisfactory explanation as to why we should have a hyperchlorohydria in appendicitis, for instance. We know that irritation about the appendiceal region will cause a true pyloric spasm. I have seen a pylorus at operation swell and blanch in contraction even with the patient etherized, when the whole trouble was with the appendix. If we have a pyloric spasm in appendicitis which prevents the regurgitation of the alkaline duodenal contents, it seems very natural that the hydrochloric acid content of the stomach should rise. It would seem that this mechanism must be taken into account. As a matter of fact, I think it is so taken into account in much of the work that is being done. Only the other day I read a report of some work along this line in which the investigator used, not the normal human animal, but dogs and took the precaution to eliminate this particular reflex by section of the cord. Until we get some experiments along those lines our results are going to show the effect of a large number of complicating factors which will be exceedingly difficult to unravel.

DR. WILLIAM R. VIS: The belief seems to be growing that the pyloric reflex is not controlled very much by the relative acid content of the stomach. In a very recent number of *The American Journal of Physiology*, Morse quotes the results of experiments done on animals as Dr. Van Zwaluwenburg suggested. They also used different solutions that were introduced into the stomach with the question in mind that we are discussing here and from their results it seemed that it did not make any difference regarding the opening of the pylorus whether water or saline solutions or acidulated solutions were used. In Starling's latest book on physiology very little emphasis is laid on the relation of acid to the pyloric reflex. The pylorus is probably influenced by nervous mechanism which centers in the duodenal wall as well as in the prepyloric region.

DR. THEOPHIL KLINGMANN: I would like to ask Dr. Gilbert why he suggested that this method of administering large therapeutic doses of acid could not be carried out in practice.

DR. GILBERT: In reply to Dr. Klingmann's question, I think it would be impractical to give such large doses of concentrated acid as it would be necessary to use a tube.

The two points which Dr. Van Zwaluwenburg and Dr. Vis brought out, I had hoped that I had suggested in the work that had been done in Carlson's observations in the two patients with gastrostomies. In those cases where we have the reflex action causing the pylorus to contract, we have instead of a hyperacidity a secretion more nearly the concentration of the normal gastric secretion.

In Howell's new edition you find practically nothing about the acid controlling the pyloric sphincter.

In addition we might say that there was practically no delay in emptying the stomach from giving the acid, more than about twenty or thirty minutes, which might be a daily variation.

A REVIEW OF CERTAIN PELVIC CASES SHOWING THE VALUE OF VAGINAL ASPIRATION AS A DIFFERENTIAL DIAGNOSTIC PROCEDURE.

HAROLD HENDERSON, M.D.

(From the Obstetric and Gynecologic Clinic, University Hospital, Ann Arbor, Michigan.)

The purpose of this paper is to call attention to the diagnostic value of vaginal aspiration in certain pelvic conditions. There are many cases in which we have a definite mass in the pelvis in the mid line, or to one side associated with pain in the lower abdomen, and fever. The history in these cases is often misleading, and since the surgical procedure depends upon the exact nature of this mass any means which will aid us in arriving at an accurate diagnosis must be most welcome.

Typical cases of acute pelvic inflammatory disease with purulent exudate offer little difficulty in diagnosis, and the same is true of a typical case of ectopic pregnancy. But many

of the cases with which we have to deal are atypical, and certain valuable symptoms and signs are missing. It is in these cases that vaginal aspiration is of most value. In ectopic pregnancy, the menstrual disturbance may be so slight as to pass unnoticed, and there may be a history of continued pain in the side, with moderate fever and leucocytosis. Likewise in pyosalphinx we may get a history of a sudden sharp pain in the side with a moderate irregular fever. There may be some menstrual irregularity, and this with the presence of a soft mass in the region of the appendages might lead us to a diagnosis of extrauterine pregnancy. An old pelvic abscess, with a dense wall may even be mistaken for a fibroid, or an ovarian cyst. In such a case laparotomy might be attempted, as in one of the cases cited below. Furthermore, many cases of ectopic pregnancy occur in women with gonorrhea, or other inflammatory condition in the tubes, and we may have both extrauterine pregnancy and pyosalpinx in the same case. In such a case, even with a clean cut history of an ectopic, aspiration is especially indicated. The presence of pus, mixed with the blood, is a contraindication to abdominal section, and in these cases colpotomy is the operation of choice.

The danger of mistaken diagnosis is evident. Although pelvic abscesses are most frequently of gonorrheal origin and sterile, yet a certain proportion of them contain active pyogenic organisms, and contamination of healthy peritoneum will sometimes result in general peritonitis. A number of years ago it was the custom to treat purulent collections in the pelvis by abdominal section, and extirpation of the abscess sac together with the pelvic organs. This is extremely dangerous, and needlessly radical. The rational treatment of pelvic abscess is not laparotomy, even if there is no danger of peritonitis, but vaginal puncture and drainage. This is safe and conservative because it gives nature the chance to restore the pelvic organs to their normal functionating condition. If symptoms persist the diseased organs may be removed when the abscess is healed.

In such cases it has been the practice in the Gynecological Clinic to employ the aspirating syringe as a final diagnostic procedure. The cervix is brought down with a volsellum forceps, and the needle inserted posterior to one side or the other, as the case may be. The mass is aspirated and the contents of the syringe noted.

Although the presence of blood does not always mean ectopic, yet this is true in such a large proportion of cases that in the presence of a suggestive history, laparotomy is indicated. The presence of pus in the aspirating syringe of course indicates colpotomy and tube drainage. The added security of such a procedure is apparent.

Vaginal aspiration is comparatively harmless. It is done only in those cases in which there is a definite cystic mass in the pelvis with a suggestive history of inflammation. If the collection of fluid is pyosalpinx the tube is enlarged and prolapsed into the cul-de-sac. If there is a collection of pus in the parametrial connective tissue the cul-de-sac is filled with a retroperitoneal abscess. In case of ruptured ectopic there is either a collection of blood in the broad ligament, and consequent displacement of the intestine, or there is a large mass of blood in the peritoneal cavity which gravitates into the pelvis. In any case the gut is lifted out of the pelvis by the exudate, and there is but little danger of puncturing it.

Should the intestines be adherent to the pelvic organs and be punctured by the aspirating needle little harm will be done. The hole will be quite small, and will contract down quickly when the needle is withdrawn, and but a minimal amount of infectious material will escape. Even if some of this should soil the pelvic peritoneum there is but slight danger of general peritonitis since the pelvic peritoneum is much more resistant to infection than that of the rest of the abdominal cavity.

This is in marked contrast to abdominal aspiration of tumor masses. Here the aspirating needle must of necessity pass through two layers of peritoneum. In large tumors, such as ovarian cysts, there is but little danger of puncturing the gut, but the fluid is under so much tension that even a small puncture hole will allow it to escape. Should this be infected, as is the fluid in many large cysts, there is great danger of general peritonitis because the peritoneum in this locality is not nearly so resistant to infection as the pelvic peritoneum. The danger of this procedure was conclusively

shown by Dr. Peterson in a case reported a number of years ago. An ovarian cyst was aspirated through the abdomen with a very fine needle under aseptic conditions. At operation a few days later a quart of free fluid which had escaped from the needle puncture was found in the abdominal cavity. In this case, however, the fluid was aseptic, and the patient made an uneventful recovery.

Despite the value of vaginal aspiration for diagnosis in these doubtful cases, the textbooks make but scant mention of it. Kelly, in his book on Operative Gynecology, mentions colpotomy as one form of treatment in old cases of ectopic pregnancy where there is little danger of recurring hemorrhage, but makes no mention of aspiration of the mass for diagnostic purposes. In Kelly and Noble's Gynecology and Abdominal Surgery, aspiration is advocated in doubtful cases. However, but little stress is laid upon this point. Crossen, Graves, and Montgomery advise laparotomy in ectopic, and colpotomy in pelvic abscess, but make no mention of aspiration as a means of determining which condition is present.

The following recent cases are quoted from the records of the Gynecological Clinic as illustrative of this point.

Case 1. Mrs. F. M., age 24, entered the Hospital April 18, 1916, complaining of pain in the left side. The past history was negative except for a stillbirth in May, 1915. The labor was normal but the placenta was removed manually. There was no history of sepsis following the labor, but she never entirely recovered her strength. For the past six months she had had an occasional pain in the lower abdomen. This pain had been getting worse, and was localized in the left side. She had had no definite chills nor fever, but had lost considerable weight and strength. Her periods had been normal, except that since her last period in March she had had a slight blood tinged discharge. Examination revealed a poorly nourished girl, very weak, and anemic. There was a tender mass in the region of the left appendage, and a tentative diagnosis of pelvic inflammatory disease was made. Ectopic pregnancy was considered, but the findings were not thought to be conclusive. The patient was observed for a week, and at no time did her temperature rise above 99.4 degrees. Vaginal aspiration showed old blood, conclusively proving that the mass was ectopic. Laparotomy was performed and a left sided ectopic, with rupture in the peritoneal cavity was found and removed.

Case 2. Mrs. C. W. age 42, entered the Hospital January 5, 1917, complaining of pain in the left side. She had been pregnant four times, having two living children, and a history of two miscarriages at the third month. The last pregnancy was seven years ago. Since last November she had had three severe attacks of pain in the left side associated with fever, each one lasting several days. There were no signs of hemorrhage with these attacks. She menstruated steadily for three weeks in November, since when she had had no regular period. She had, however, a slight show of blood on several occasions. Examination revealed a mass on the left side of the uterus, displacing it somewhat and extending half way to the umbilicus. Her temperature before operation varied from normal to 101 degrees. Aspiration showed a thin purulent fluid, and posterior colpotomy was done, liberating a large amount of foul pus. A rubber drainage tube was inserted and the patient made a good recovery.

Case 3. Miss S., age 27, colored, entered the Hospital November 20, 1916, as an emergency, complaining of pain and tenderness in the right side. She had been repeatedly exposed to pregnancy. She flowed normally in September and scantily in October. Since November 4th, she had flowed continuously, but had never passed any clots or pieces of flesh. The pain in the right side had been gradually growing worse. There was no history of hemorrhage although her hemaglobin was only 65 per cent. by the Miescher method. Examination revealed a mass on the right side reaching almost to the umbilicus and the uterus was displaced somewhat to the left. Her temperature was 100.4° the evening preceding the operation. Vaginal aspiration showed dark fluid blood. Laparotomy was performed and a right sided ectopic removed, together with a large amount of old blood. The patient made an uneventful recovery, and was discharged two weeks after operation.

Case 4. Mrs. M., age 40, entered the Hospital April 26, 1916, complaining of pain in

the left side, irregular menstruation, and backache. Her last normal period was December 20, 1915. In January and February she flowed scantily, and not at all in March. On April 6th, she was seized with a sudden sharp pain in the abdomen, and felt faint. The pain was present at intervals for three weeks, becoming more marked the week previous to entrance to the Hospital. She had been flowing slightly for the past two days. At no time had there been any definite history of fever, and her temperature was normal on entrance. Examination revealed a very tender, cystic mass on the left, about the size of an orange. A definite diagnosis of ectopic was made. Aspiration revealed nothing but a clear cystic fluid, but since there was no pus in the pelvis, an incision was made and a left ovarian cyst the size of an orange was removed, together with the ectopic mass which had ruptured into the peritoneal cavity.

CASE 5. Mrs. C., age 28, entered the Hospital January 26, 1916, complaining of a tumor in the lower abdomen. She was operated in September, 1916, when an attempt was made to remove the tumor. The attempt was unsuccessful, and two weeks afterward the lower pole of the wound began to discharge and this had continued ever since while the tumor had grown more rapidly. She had had no fever and no pain during this time. Her last period was in August and there had been no show since. Examination revealed a hard, non-cystic mass filling the left side of the pelvis. A small fibroid nodule was felt on the anterior surface of the uterus. Vaginal aspiration revealed the presence of pus, and the entire mass collapsed after colpotomy. The patient made a good recovery, and although the abdominal sinus had not quite healed on discharge, yet it had stopped draining.

In each of these cases vaginal aspiration gave us very valuable information. In Cases 1 and 3 it conclusively demonstrated the presence of extrauterine pregnancy. In Case 4, although the ectopic mass was not reached by the aspiring needle the presence of clear cystic fluid ruled out pelvic abscess, and the typical history of ectopic made it perfectly safe to make an incision. In the fifth case, laparotomy had actually been performed on an old pelvic abscess under the supposition that it was an ovarian cyst. The result of this inaccurate diagnosis was that the patient was left with the discharging sinus.

The result of a more general application of this diagnostic procedure will be that the indications for colpotomy and abdominal section will be more definitely determined. As a consequence, we will have fewer cases of peritonitis and persistent abdominal sinuses.

The conclusions which we may draw from the consideration of this subject are as follows:

1. That it is impossible to differentiate clinically between atypical cases of ectopic gestation, and purulent collections in the pelvis.

2. Typical cases of ectopic may be combined with pyosalpinx.

3. In case of a mistaken diagnosis, laparotomy in the presence of pus, is a dangerous and unnecessarily radical procedure.

4. Vaginal aspiration is comparatively harmless, and may be employed in the routine ether examination without materially prolonging the operation.

5. Abdominal aspiration is not safe.

6. Although blood in the pelvis does not always mean extrauterine pregnancy, nevertheless laparotomy is justifiable in the presence of such findings.

DISCUSSION.

DR. REUBEN PETERSON: I don't know that I have much to add to Dr. Henderson's excellent paper. I have always felt that vaginal aspiration has been insufficiently emphasized. My mind goes back to about 1890, the beginning of the radical treatment of pus in the pelvis. At that time we were influenced by the teachings of Joseph Price and other radical operators. These men did a great deal for abdominal surgery. Before that time we had been cowardly. At that time I was an interne in a hospital and I saw how these pus tubes and pelvic neoplasms were treated. The common method then was to make a small incision in the culdesac and stick in a drainage tube through the very small incision after evacuating the pus. Then it was the duty of the interne to wash out these cavities. Because of insufficient drainage the smell was horrible and we dreaded this class of cases. They didn't get well. There was a long continued sinus. After a while the drainage tube was removed. The patients were emaciated, very weak, and septic. I remember very well when I was an interne in the Free Hospital For Women at Boston. Price made a visit to the clinic and he was taken around and shown these patients. It wasn't a very good exhibit. He said to the surgeon in charge, "Why don't you open the abdomen and clean out the pelvis?" The surgeon

said, "Why, I never heard of such a thing." Dr. Price said, "If you go to work and open up the abdomens and take out the pus tubes these patients will get well." He went all over the country preaching this doctrine, and we young men who were ambitious to do abdominal surgery followed his teachings for six or eight years. It was considered cowardly not to open the abdomen and remove a pus tube, no matter how large the pus tube or how many technical difficulties there were. We persisted in this method in spite of quite a high mortality. The high mortality could not all be explained by the fact that we were new to abdominal surgery because even after we had had a great many cases a certain proportion of patients died from general peritonitis. The mortality was a great deal higher than the operators were honest enough to acknowledge. I think that it was as high as 10, 15, and perhaps 20 per cent. I remember very well the case that led me to change my practice in the treatment of pus tubes.

I was called to see the daughter of a physician in Grand Haven. She had been septic with a very large pus tube for a number of weeks and her father had been loathe to have her operated upon. She was in such a bad condition that I told him it would be folly to attempt an abdominal operation and the only thing I could do was to open the culdesac and let out the pus, which I did. I said, "Afterwards when she has recovered her health and strength, we can remove the pus tube." That woman never was operated a second time, much to my surprise. She got perfectly well and in less than a year's time it was impossible to tell on which side the pus tube was. Since that time I have treated pus in the pelvis by means of the vaginal incision.

However, what Dr. Henderson has brought out so well will always obtain in pelvic and abdominal work. It is not always so easy to make a diagnosis between pus tube and ectopic pregnancy. It is not always so easy to tell whether you have a fibroid or a large amount of inflammatory tissue in the pelvis. Anyone who says he can always make a diagnosis from the history or physical findings does not sum up the results of his experience. For that reason it has been my custom to use for a number of years the vaginal aspirator because if there be pus in the pelvis, I think I am doing much better for my patient to make an opening from below. There is not much danger, the needle is fine, everything is shut off, and if you do puncture the bowel, which I don't remember of doing, it would not do any harm. We must not forget also that a ruptured ectopic eventually may become purulent and if the mistake is made and the abdomen is opened in such cases it goes very hard with the patient and the mortality is very high. So, looking at it from all aspects, it is a safer procedure to insert a needle prior to the more extensive opening of the posterior culdesac to drain whatever may be necessary in the pelvis.

I well remember the case which he speaks of where the aspiration was made through the abdomen. We had gone over this case very carefully in the clinic and had made a diagnosis of ovarian cyst, and in order to prove it to the class, I inserted a long needle through the abdominal wall and drew off some fluid. We operated later and found a pint or two of fluid in the abdominal cavity. It is an entirely different matter when the aspiration is made from below.

Dr. R. A. Bartholomew: I was also somewhat interested in looking over the textbooks to find that out of four or five of the better known textbooks on gynecology, there was only one, Kelly and Noble, that made any mention of vaginal aspiration as a means of diagnosis. As Dr. Henderson has said, the necessity for this procedure is found to be greatest in those cases of ectopic which are somewhat atypical and resemble inflammatory cases. Kelly also gave statistics showing the relative mortality in cases where abdominal operation was done and in cases where posterior colpotomy was done, the former having a mortality of about 27 per cent. and the latter about 2 per cent.

The behavior of the tube when it begins to distend with pus or blood is rather typical in most cases. Apparently the weight of the ovary and the posterior traction of the infundibulo-pelvic ligament tends to pull the tube over in the posterior direction, and as it further distends, it comes to lie against the vault of the vagina where it is very accessible to the needle and in such cases the diagnosis can be made without danger of injuring the intestine or ureter.

Dr. R. W. Kraft: I would like to ask Dr. Peterson a question. As I understand it, in 1890 these patients who were drained were cachectic. What difference is there in the drainage now in order to insure a good recovery at this time when at that time they remained septic. How does the operation of the present day differ from the operation of 1890?

Dr. Peterson: There was a medical incision made in those days just long enough to introduce a small drainage tube. There were no apartments of the pus tube broken up so that you used to have a number of cavities and only one of them drained. In the modern operation of colpotomy an incision is made from one side of the pelvis to the other and the finger introduced along the posterior wall of the uterus. All of these cavities are broken up so that you get good drainage. Then having such a large surface to drain through, you don't get the retention of pus you used to in the old days.

AFTER HISTORY OF A PATIENT WITH INOPERABLE VESICOVAGINAL FISTULA WHERE THE RECTAL WAS SUBSTITUTED FOR THE VESICAL SPHINCTER.

REUBEN PETERSON, M.D.
(From the Clinic of Obstetrics and Gynecology, University Hospital, Ann Arbor, Michigan.)

I desire to place on record the after-history of a patient whose case I reported rather recently before this Society. It was the case of a woman who had had her bladder and the upper part of the vagina torn all to pieces by the unskillful application of the obstetric forceps. There were so many adhesions in the upper part of the vagina that it was impossible to locate either the cervix or the external os. After attempting to close the fistula and failing because of the condition of the parts, an opening was made in the rectum and the vagina closed.

The patient made a good recovery, being able to retain the urine for some hours through the action of the rectal sphincter. Naturally it was thought that the menstruation would have to be stopped by some method to prevent the retention of the menstrual blood within the uterus. However, just before she left the Hospital she began to menstruate through the rectum and we allowed the patient to go home after warning her that she might have to return in case of subsequent trouble with the menstrual function.

Subsequently she wrote me that she was much improved in health and that she would consider herself perfectly well except for terrific cramping pains just prior to the menstrual flow. These pains she described as something fearful until they were relieved by the appearance of the menstrual blood in the urine passing by way of the anus. The cause of the pains was perfectly apparent. They were due to efforts on the part of the uterus to force the menstrual blood through an os buried in cicatricial tissue. When once the obstruction was overcome and the flow established, the patient was relieved.

After the patient re-entered the Hospital various methods of relieving her were considered. It seemed useless to attempt to find the external os through the rectovaginal opening since such an attempt had failed when access to the upper part of the vagina had been had through the introitus aided by sight as well.

The choice then lay between stopping the menstruation by means of the X-ray or removal of the ovaries. The patient objected to the former method on the ground that she might have to remain in the Hospital too long. She preferred removal of the ovaries which she claimed were of no use to her since she could never have any more children and since even sexual intercourse was impossible. So the ovaries were removed through an abdominal incision yesterday with the expectation that menstruation will cease and a cure will result.

It is not claimed that the series of operations on this patient constitutes ideal surgery. It is only applicable to the unusual case of bladder fistula, since in nearly all cases the opening can be closed by one or more operations. However, where that is impossible because of the loss of the bladder sphincter or for other reasons, I claim it is a procedure which can be counted on to give great relief to the patient. I showed this patient in the Gynecologic Clinic yesterday and she expressed herself as being very happy over her present condition when compared with the sufferings she underwent when her vulva and thighs were continually wet with the dribbling urine. She stated that if she could be relieved of the recurring menstrual pain she would be perfectly contented.

In looking up the literature of such operations I find that quite a large percentage of the patients ceased to menstruate after the rectum was opened and the vagina closed. It is rather difficult to explain why menstruation ceased since the ovaries were not removed, nor was there anything about the operative technic to cause cessation of the ovarian function. Where menstruation continued after the operation, no untoward results, such as infection of the uterus, resulted. This lack of uterine infection, as well as the absence of renal infection, would tend to show that very few colon bacilli found their way into the vagina through the rectal opening.

TRANSACTIONS

OF THE

Clinical Society of the University of Michigan

Stated Meeting, March 7, 1917

The President, CARL D. CAMP, M.D., in the Chair
Reported by REUBEN PETERSON, M.D., Secretary

DEMONSTRATION OF TWO PATIENTS SHOWING ABNORMALITIES OF CONDUCT ASSOCIATED WITH PSYCHONEUROTIC DISORDERS.

ALBERT M. BARRETT, M.D.

(From the Psychiatric Clinic, University Hospital, Ann Arbor, Michigan.)

1. *A Patient Showing Abnormal Impulsions Associated With Stealing. Kleptomania.*

Those who are interested in problems of criminality are sometimes concerned with cases in which the impulses which lead to crime are so unusual in their intensity that they at once suggest the character of being abnormal and even manifestations of a definite disease.

In adults and criminals who are repeated offenders the pathologic character of the impulsiveness leading to the act is not always convincing and the problem of differentiating between responsibility and irresponsibility is difficult. Even among these there are individuals who in addition to abnormal impulsive reactions have other symptoms of psychoneurotic character, which suggest that their acts are not to be judged by the standards applied to normal individuals.

Occasionally this problem is met with in the consideration of the conduct of juvenile delinquents.

Recently there came under our observation a young boy aged eleven, who had been brought into the Juvenile Court of Wayne county because of truancy and stealing small sums of money. The fact that his stealing was of a peculiarly impulsive character and was frequently associated with headaches and neurotic manifestations, suggested the desirability of medical observation and on February 3rd, 1917, he was admitted into the Psychopathic Hospital at Ann Arbor.

He was a boy of good physical development and attractive in his childish frankness and nice manners. He appreciated clearly the circumstances associated with his coming to the Hospital and frankly told with little embarrassment that he was here because he "stole and had headaches." For many years he has been unable to resist taking sums of money, usually small, which he knew might be within his reach. He has done this as long as he can remember. Rarely is there any previous planning of a theft. It is only after seeing the money that the desire for it arises and he then is uneasy until he gets it. If there is no one present he will take it at once. If others are in the vicinity he waits for an opportunity. Any delay in carrying out his impulse is distinctly troublesome to him and is accompanied by definite physical suffering. He describes this as a headache which increases in intensity until he sometimes becomes nauseated. His mother has often observed this disturbance. She remarks that his face becomes drawn and there appear in his forehead marks like finger dents. After the headaches pass away, feelings of dizziness come on, which last from a few minutes to half an hour. If he can at once take the money these disturbances remain absent. The money is always spent for candy. On one occasion he took the pocket book of his teacher which contained over $12.00 and within a few days spent the entire amount for candy. These attacks are becoming more severe and frequent and are only associated with his impulse to steal. Recently he has been watched so carefully that he has had few opportunities to get money. As a result he seems to be continually under extreme nervous tension.

In addition to this he sometimes experiences attacks in which he gazes at the wall as if dazed. Sometimes in these he laughs and twists his mouth peculiarly. Only if shaken and called

to loudly does he rouse out of these. Afterwards he always seems rested and relieved. Of late he has been walking in his sleep. At these times he will hold conversations with his mother, answer questions rationally, and in the morning have no memory of the incident. These experiences are always preceded by a severe headache before going to bed.

He himself describes periods of staring at the wall, where he sees pictures moving before him. These take the form of some picture play he had previously seen. Dreams are frequent. Often these are of people coming with guns and knives to kill him. Recently after having taken fifty cents from his mother's room he dreamed that he went to the bakery and spent all of the money for cakes. There was a man in the shop and money was falling out of his pockets. When he was leaving there were little piles of coins lying about the floor. These he picked up and hid in his pocket as he left for home.

Since he has been under observation in the hospital there has been one instance of sleep walking. Several times he has told of dreams of fantastic and vivid character. In other respects his reactions have been those of a normal healthy boy. In his intellectual development he passes successfully the tests of the Binet scale for the age of fourteen.

That in this case we are concerned with a psychoneurotic disorder is evidenced in the hysterical disturbances of consciousness which occurred at various times and the presence of diminished pain appreciation over one side of the head and right side of the body, and a slight hysterical contraction of the visual field.

An important factor in the production of his disorder is the presence of syphilis, which is shown by a positive Wassermann reaction upon his blood, which has been repeatedly obtained. At first this was of a 2 plus strength and more recently it has been 4 plus. The cerebrospinal fluid shows 6 cells per cu. mm. and a very slight change in color of the third, fourth and fifth tubes by Lange's colloidal gold test. Otherwise the fluid is not pathologic. The only neurologic evidence of the effect of syphilis is inequality of the pupils and a slight slowing of the light reaction. There are no stigmata of syphilis seen in the teeth or body structure.

An interesting factor of possible determinative importance in directing the abnormal impulsive thoughts towards stealing rather than in other directions is that the boy's mother was a repeated offender by stealing and was a sex delinquent. This led to a divorce by his father when the boy was about two and a half years old. The children were then cared for by their father's mother until our patient was about seven years old. Since then his new mother has been very fond of him and his home relations have been unusually good.

It is possible that the boy's acquaintance with stealing has been directed by discussions in the family of his own mother's conduct. It was never because of lack of money because he was always given all he needed to spend for his childish wants.

In the peculiar impulsive character of the stealing the case may be grouped with the disorder classed as kleptomania. The important factor in this, as in other impulsive antisocial acts, is the irresistible force which leads to the action and which places these as types of disorders which are to be judged from the medical as well as the forensic point of view.

As treatment the boy has received seven intravenous injections of salvarsan without any improvement in the Wassermann reaction. In view of this, further treatment along this line will be discontinued for the present and the boy will be given a series of intramuscular injections of mercury succinimid.

It is not best that he be kept much longer in the Hospital. As he has been living in a crowded city district, it is advised that his life for the next few years be in some place in the country, or at least away from the associations which have in the past so intimately been related to his acts of stealing. Were he to return to these it is doubtful if he could remain well.

It is probable that after a few years the strength of these impulses may be lessened as his interests become attached to occupations and diversions harmless in their nature. However, the prognosis must be doubtful in view of the constitutional syphilis and the existence of an hysterical temperament.

2. A Case of Compulsion Neurosis.

A condition somewhat similar to that of the small boy in that the conduct of the individual stands in a very close relation to emotional disturbances of unbearable effects, is found in a young Italian woman who has been in the State Psychopathic Hospital for a few weeks. For some time she has been suffering from a feeling that she is being contaminated by uncleanliness and that she in turn may spread this contamination to those around her. This has led to her spending hours each day in

cleaning her home, her clothes, and whatever she may come in contact with. This impulse to avoid objects that she fears may contaminate her and the great expenditure of energy necessary to keep herself and her environment clean makes her life a burden to her and brings her to the Hospital for treatment.

She is an Italian woman, twenty-three years old, who came to this country when a child and lived here until she was about twelve. At this age she returned to Italy and for three years was a student in a convent. After this she returned to this country and at the age of fifteen was married. Almost at once there occurred experiences which made her future married life unpleasant and undoubtedly had much influence in the development of her obsessions.

In August, 1914, she was in Italy caring for her grandmother who was dying from a cancer. There developed at this time a fear that she might be contaminated if she came in contact with the toilet seat. It was not so much a fear of her own contamination as it was that she might bring harm to others whom she came in contact with. For this reason she would wash the seat thoroughly and then be careful that all that had been employed in the cleansing process was put away so as not to touch others. Her own hands she would wash repeatedly and even then she would wash her dress at night because she might have contaminated this in handling the buttons during its removal. Should she touch the tablecloth she would not be easy until it had been washed. One can imagine how extensively such an idea must affect her conduct in all of its phases. Her life became a continuous series of cleansing acts and of great scrupulousness in avoiding objects which might in some way have come into contact with a toilet. Such was her condition when she entered the Hospital on January 27th of this year. She was at this time in the later stages of pregnancy. The fear of contamination and of being unclean concerned all of her activities. She realized clearly the foolishness of her fears but no matter how hard she tried the fears still remained and caused her continued torment.

One incident and its ramifications is illustrative of many others which are continually occurring. On one occasion, recently, she saw a nurse throw a rag, which had been used to clean the seat of the toilet, into the waste can. A day or two later she herself threw something into this same can, and in doing so thoughtlessly touched the cover. At once there arose the memories of the rag which had been thrown away a few days earlier. She then felt as if she had been made unclean, and that she had contaminated everything she had come in contact with since the incident. It was impossible for her to feel comfortable until she had thoroughly cleaned herself, her hair, her room and numerous objects about the ward. Even after doing this there still remained an uncertainty as to whether she had done all that she could and for this reason she was quite uncomfortable.

While these obsessing fears vary in their intensity, with occurrence of incidents which may precipitate them, there is continually present a state of dejection as she realizes her helplessness in resisting their force.

One recognizes that the symptoms and course of this disorder belong to that form of the psychoneuroses, described sometimes as obsessional neurosis, as psychesthenia, or more frequently as compulsion neurosis.

The specific character of the ideas and fears which obsess the individual vary much. While in this instance the fears stand in relation to the idea of being unclean or contaminated, constituting a clinical variety sometimes designated misophobia, in other instances the fears may relate to places, such as the varieties, claustrophobia and agoraphobia, or to fears and dreads of a large variety of objects or situations.

In all instances the idea which has the compelling force is one which in some way has become over-emphasized with feeling. It is this over-emphasis that gives it an obsessing quality.

Freud has shown that the particular idea which obsesses the individual has not normally the amount of feeling quantity which it now bears. It has taken to itself feeling which originally was a part of some other idea. This feeling becomes available for the attachment by derivation from some idea which had been repressed from the consciousness of the individual because of its unbearable qualities. The feeling then remains free, and ready to attach itself to some other idea. Commonly the idea which attracts the feeling is one which in itself is of more than usual emotional emphasis. In the case of our patient this idea was that of uncleanliness.

The ideas which are most liable to repression are those which stand in opposition to the feeling of right. Experiences, in the study of psychoneuroses, are quite convincing that the commonest ideas to awaken conflicts and thus bring about repression, are of sexual character.

When we study the past experiences and reactions of our patient, with the view of finding a source for the development of mechanisms leading to the compulsive ideas which are troubling her, we find that her life has been rich in factors which are of great significance for the origin of a psychoneurosis.

We find that soon after her marriage, she discovered that her husband had previously been married and thus, according to the doctrines of her church, she had committed a great sin. There was always present, after this, a feeling of doubt as to what course she should take and whether or not she should leave her husband. She never developed a normal affection for her husband and in her marital relations she was sexually anesthetic. Because of this attitude her husband became suspicious and jealous and thus the difficulties of her situation were increased. Conditions were created which made it easy for any latent tendency to a psychoneurosis to assert itself. However, these did not offer any adequate explanation for the origin of the feeling which gave to her ideas such obsessing qualities. Such, according to Freud, must have their origin in experiences encountered during the early child life, which later lead to conflicts and thus to repressions. As one might expect, there are no conscious memories of experiences which might have traumatic force. Her life as a child was made unhappy by quarrels between her mother and father, after one of which she had an attack of complete deafness for three days. She seems to have been unusually scrupulous in her habits. Even as a child she remembers the contrasts between cleanliness and uncleanliness being forcefully presented to her in matters of discipline.

There are several occurrences in her childhood days which show a peculiarly responsive attitude on her part towards matters of sexual suggestiveness. As she looks back, she now recalls, that others must have thought her interested in such matters from the way they spoke to her about them. She herself cannot recall that she was unduly curious nor did their sexual character suggest itself at that time. Had any such interest been present, her training for three years in a convent would have furnished occasions for severe mental conflicts. Here between the ages of 12 and 15 she was continually taught the evils of worldly thoughts. On one occasion she was severely disciplined for what was on her part an entirely innocent action, but was regarded by the sisters as something suggesting sexual curiosity. Immediately after leaving the convent she became deeply attached to a man whom it was impossible for her to marry. A few months later, at the age of 15, she married her present husband, and entered into a life full of difficulties and trying experiences.

She has been under observation too short a period for one to feel that much has been learned about the etiologic mechanisms. What has been learned has been of interest, in that it agrees with what is usually found as the basis upon which the psychoneuroses develop.

While the condition at the present time is a compulsion neurosis, there have been through her life episodes distinctly hysterical in their nature. Such as the attacks of deafness during childhood and the sexual anesthesia that has persisted during her married life.

It is of interest to note that she has suffered most from her compulsive ideas at times, when her general health has been impaired, and when her marital difficulties were most trying. Her recent fears have been much increased since she has been pregnant.

The patient will remain in the Hospital until after confinement, and it is hoped somewhat longer. If so, it may be possible to carry through a psychoanalytic study of her experiences, in the hope that it will lead to a better understanding of the origin of her fears and to an improvement, if not cure, of her troublesome disorder.

DISCUSSION.

DR. CARL D. CAMP: I was particularly interested in one feature of the first case and that is the presence of inherited syphilis. While it is possibly true that the inherited syphilis has no direct connection with the impulsive psychosis, yet the case resembles very closely cases reported under the title of "degenerative hysteria" where there is a tendency to truancy, prostitution in the case of girls, and kleptomania and incendiarism in the case of boys, and I have been rather struck with the frequency of a report of a positive Wassermann reaction in these cases. I think that is a point for further investigation.

A CASE OF SARCOMA OF THE SPINAL CORD, WITH OPERATION.

CHARLES L. WASHBURNE, M.D.

(From the Surgical Clinic, University Hospital, Ann Arbor, Michigan.)

The following case of spinal cord tumor is brought to your attention because of the multiple character of the tumor growth and its successful removal with two subsequent operations rendered necessary by the persistence of

spasticity in the muscles of the lower extremity.

In the autumn of 1912, the patient, a lady 32 years of age, began to have sharp shooting pains beneath the right scapula, rendered more severe by use of the arm. The previous personal and family history is negative. Up to July, 1914, there were repeated attacks of sharp, shooting pain in the same locality. The pain, in the latter part of 1913, began to be referred to the right lower rib margin, in the region of the gallbladder and a band-like feeling developed at the level of the ninth rib, on the right side. In November, 1914, the pain left the right side and shifted to the left scapular region. The band-like sensation developed on the left side at the same level as on the right and was continuous about the body.

The patient gradually became unable to rise from a reclining position and spent most of her nights sleeping in a chair. In September, 1915, a nephropexy was done on the right kidney. This operation did not relieve the pain.

August, 1915, the patient gave birth to a child and at once noticed numbness and loss of the sense of position in the feet and legs. The hamstring muscles became spastic so that she was unable to stand. In May, 1916, there was a sudden complete loss of control of the sphincters of bladders and rectum.

The patient entered the Neural Clinic of the University Hospital, August 11, 1916. The neural examination by Dr. Camp was as follows:

Fairly well nourished woman of 36 years. Legs are contracted and in flexion. Contraction can be overcome with difficulty. There is anesthesia of the skin extending about two and one-half inches above the umbilicus in front and higher in the back. The X-ray from the fourth to the twelfth dorsal vertebra is negative. Wassermann on the blood, negative. All reflexes markedly exaggerated. Positive Babinski.

August 17, 1916, the patient was operated upon in the Surgical Clinic. A linear incision was made over the spine about ten inches in length, the seventh spine being at the center of the incision. The spinous processes were exposed and from the fifth to the ninth were removed. By means of bone forceps the posterior part of the spinal column was opened, exposing the dura from the level of the fifth to the ninth vertebra. Exactly at the level of the seventh vertebra a definite bulging of the dura was noticed and a marked resistance to the palpating finger. This swelling was about one and a half inches in length. Hemorrhage was controlled by ligatures and by gauze soaked in adrenalin solution, 1-10,000. The dura was opened at the site of this swelling and a tumor was exposed. This tumor lay in the subdural space and was connected by fine fibrous strands to the dura and to the pia. The tumor itself was freely movable and was easily removed. It was smooth, about the size and shape of a large pecan nut or a pigeon's egg. Adjoining this there was also a similar tumor about the size of a large pea, which was removed without difficulty. The spinal cord at this point gave evidence of much pressure but had not been invaded by the growth. The dura mater was sutured with fine catgut. The soft tissues were sutured with iodine catgut and the skin incision closed with silkworm gut. A soft rubber drain was inserted in the depths of the wound.

The pathologic examination of the growth removed showed spindle celled sarcoma, possibly arising from a neurofibroma.

Examination eight days following the operation showed temperature, pulse and respiration normal. There was severe drawing pain in both legs. Incontinence of urine and feces. Knee jerks equal. Marked ankle clonus. Complete loss of sense of position of the toes. Anesthetic areas at pubes in front and at lumbosacral articulation in the back.

The patient gradually improved and at the time of discharge from the Hospital, September 19, 1916, had fair control of bladder and rectum and could straighten the legs with some difficulty. The band sensation had entirely disappeared. After leaving the Hospital, a sharp, pulling pain developed in the sacral region. The thighs became flexed on the abdomen, and the legs flexed on the thighs. The contractions could not be passively overcome.

She returned to the Hospital November 30, 1916. The examination at that time showed a marked spastic condition of the muscles of the lower extremity. She had perfect control of the sphincters. The condition did not seem to be progressing. It was doubtful if there was a recurrence of the growth, more probably the present condition was due to permanent injury to the cord from the former growth. Exploratory laminectomy was advised.

December 12, 1916, patient was again operated in the Surgical Clinic. An incision was made from the seventh dorsal to the second lumbar. The spinous processes and laminae were removed from the second lumbar, upward to the site of former operation. The cord was

uncovered and no tumor mass found beneath the dura. The cerebrospinal fluid was under pressure. The cord pulsated readily. A director was passed upward, and the site of the former operation explored without locating any tumor. The dura was opened the entire length of the incision. The cauda was picked up and on the left side, the fifth lumbar and second sacral sensory roots were cut, also the twelfth dorsal. On the right side, the first sacral, fourth and fifth lumbar roots were picked up and cut. Spasmodic action was obtained in the limbs, while handling these roots. Care was taken to avoid injury to the third, fourth and fifth sacral roots. The dura was closed with continuous number 0 catgut sutures. The muscles and fascia of the back were stitched with number 2 chromic gut. The skin was closed with interrupted sutures of silkworm gut.

Following this operation the muscles of the thighs and knees gradually relaxed for about a week but did not completely straighten. During the second week the pulling and spasticity recurred. Evidently sufficient nerve roots had not been cut or the resection had been too low. The thighs became again tightly flexed, also the knees were forcibly flexed on the thighs and there was almost a constant pulling pain.

At the request of the patient, a third operation was done, February 17, 1917. An incision was made on a level with the second lumbar vertebra. The tissues were dissected up, the dura opened and the cord exposed. There were some slight adhesions between the cauda and the dura at this point, which separated readily with a blunt instrument. The first, second and third posterior lumbar roots were picked up at their points of exit. A complete resection of the second and third sensory roots was made on either side. The first lumbar roots were left intact. The cut ends of nerve roots of the former operation were plainly visible and had made no attempt at attachment. The dura was closed with continuous number 0 chronic gut, the fascia, with number 2 chromic gut. A rubber tissue drain was inserted beneath the fascia layers for drainage. The skin was closed with continuous silkworm gut sutures.

March 6, 1917. Since the operation, the patient has been more comfortable. There is, on the right side, a burning sensation in the thigh, leg and foot, but no recurrence of the muscle spasm. The left leg shows a similar condition and both are straightening out rapidly. There is good control of the sphincters. The wound is healed.

Whether the spasticity in this case will be entirely overcome and the patient able to get about on her feet, or whether the muscle spasm will again recur, we are not prepared to conjecture at this time.

DISCUSSION.

DR. HAROLD DE B. BARSS: I have had the privilege of assisting at these operations and it is a case which I have been watching with a great deal of interest. I cannot say why the symptoms showed such marked improvement after the second operation, followed later by an exacerbation of the same symptoms and therefore it was with great interest that I watched the third operation and found that the nerves cut at the previous operation were still sectioned and showed no attempt at repair. We could not account for it by any error in technic at the previous operation. It was interesting also to note that after the second and third operations for a few days there was complete loss of control of the sphincters and that gradually she has obtained control of these functions. There is now complete control of the anal sphincter and she is slowly regaining control of the vesical sphincter. Her condition seems rapidly improving and we have every reason to hope that whatever was causing the extreme spasticity has now been ameliorated without necessitating the interference with the motor nerves. In that way we hope that she may gain use of the limbs whereas if we had done a more severe operation such as resecting the motor nerves, we might have removed the spasticity immediately but have obtained a permanent paralysis.

DR. CARL D. CAMP: One practical point is that this patient had the diagnosis of tumor of the spinal cord made some six months before she came to this Hospital and at that time an operation was advised but the patient refused to have it. This diagnosis was made by someone in Chicago. When she came to this Hospital she was, of course, quite prepared to have an operation, but it seems a great pity that she did not have the operation when the condition was first diagnosed because if she had, she probably would be entirely well at this time. After a tumor has compressed the spinal cord for a long time degenerative changes take place which are not relieved by the release of pressure.

DR. WASHBURNE: I have not had a great deal of experience with spinal cord tumors. This case was wished onto me, I being the only surgeon present during the summer vacation. It is rather interesting to me to see how many sensory nerve roots can be cut and the patient still have sensation. I shall watch this case with a great deal of interest to see just exactly how much good our operative procedures have done. I think already enough has been accomplished to warrant these operations. This woman was a pitiful spectacle when I first

saw her as she had no control of the sphincters, whatever.

There are other things we can do with this case if the spasticity recurs. We can do as is done in spastic paraplegia in children, tenotomies for the purpose of relieving the muscle spasm. I don't think this is going to be necessary unless the condition recurs. It seems to me that her limbs are beginning to let up. She does not complain of a pulling pain any more. It is a burning sensation. This is the first time that this has been so. So I look upon this as a hopeful case. We are going to put Buck's extension on the legs for the purpose of extending the knees, which will not relax on account of having been in this position so long. When the legs are straight we shall put on splints to hold them in position and get her on crutches as soon as possible.

THE DIFFICULTY OF DEMONSTRATING SPIROCHETES IN SYPHILITIC PLACENTAE.

R. A. Bartholomew, M.D.
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In a recent study of a series of cases of pregnancy complicated by syphilis (1), I was impressed by the fact that in a considerable number of cases of undoubted syphilis, the placentae were diagnosed histologically as only suggestive and occasionally as entirely negative. In another group of cases there was almost no clinical evidence of syphilis and yet the placentae were diagnosed histologically as typically syphilitic.

The occasional failure of the clinical to confirm the histologic findings and vice versa, has more than a purely scientific interest, in that we are occasionally unable to recommend for adoption, an infant, negative in every way except for a placenta diagnosed as possibly or positively syphilitic. To be on the safe side, we often institute thorough antisyphilitic treatment in such a case—perhaps unnecessarily.

If such placentae really are syphilitic, the one absolutely conclusive proof should be the demonstration of the spirocheta pallida. Attempts to demonstrate the spirochete in syphilitic placentae by the silver impregnation method of Levaditi have frequently been made by different observers with results varying from partial success to complete failure.

The results of investigation along this line up to the present time have been collected and reviewed by Dr. E. P. Davis, of Philadelphia in a paper entitled "Syphilis In Its Relation to Obstetrics." (2) To quote from this paper: Mohn reported sixteen cases of which six were positive. The spirochetes were frequently present in normal villi but were not found in decidua nor in spaces between villi nor in aggregations of cellular tissue. In the cord they were present in the walls of the vessels. He believed the evidence pointed to the passage of the infection from the fetus and not from the mother and inferred that in clear cases of syphilis the cord will be positive in 50 per cent., and the placenta in 70 per cent. Vollich and Leonditi found spirochetes in the fetal part of the placenta but only few in the maternal portion.

From a review of the literature and personal observations Davis concluded that the spirochete is the best evidence of syphilis; that the organism is rarely found in the placenta, but if present, it is in the fetal portion, in the walls of the villi, favoring the idea of the transmission of syphilis from the fetus to the mother; that in cases where the mother is syphilitic, although the fetus may show no signs of syphilis, spirochetes are found in the cord in over 50 per cent. and where both parents are syphilitic, the placenta shows evidence of syphilis in 70 per cent.

That these figures do not give a true estimate of the difficulty of demonstrating spirochetes in syphilitic placentae is attested by the results obtained by Pauli (3) who examined twenty-four histologically syphilitic placentae, by the Levaditi method and in not a single case was he able to demonstrate a spirochete although careful search was repeatedly made. In eleven of these cases large numbers of spirochetes were found in the fetal organs at autopsy. After a review of the literature on the subject, he concluded: 1. That the spirochete is rarely found in syphilitic placentae and then only after prolonged search. 2. That the anatomic changes in the placenta result from toxins produced by the spirochetes in the fetus and are not due to the actual presence of the organisms in the placenta. 3. That the placenta is not the focus of infection, this conclusion being borne out by the fact that the spirochetes are never found in the maternal portion of the placenta but only in the villi themselves.

Plass (4) reports the finding of the spirochetes in the tissues of thirty-five out of seventy-five babies dead from all causes and autopsied, but evidently he did not search for the organisms in the placenta, as he adds: "The Treponema pallida are present in the syphilitic placenta in such small numbers that they can be

	MOTHER						CHILD AT BIRTH.					PLACENTA			CORD		CON-TROL.
Obst. No.	Full-term	Prem.	Misc.	Abort.	Wasser.	Notes.	Wt.	Condition	Wass.	Subsequent History.	Spiro-chetes demon-strated.	Hist.	Levaditi sections	Result	Levaditi sections	Result	Result
1196	1			1		No history of lues. Premature labor 7½ mo.		Still-born.	+++			(4)	3	Neg.			Positive
1229	1				++++	Secondary stage of lues during third mo. of preg. Not treated. Prem. labor.		Still-born macerated.		Autopsied. Lues.	Positive	(4)	2	Neg.			Positive
1235					—	No history of lues. Mild acute nephritis at 9th mo. Full term labor.	3720	Apparently normal.	—	Remained well. Wassermann negative at 5th week.		(3)	3	Neg.			Positive
1242				1	++++	No history of lues. Full term labor.	4120	Apparently normal.	—	Remained well.		(1)	3	Neg.			Positive
1268					+++	Premature labor at 7½ mo. during secondary stage of lues. Not treated.	1870	Premature but apparently normal.	—	Survived. Given inunctions. Wass. neg. at 4th mo.		(3)	4	Neg.			Positive
1283		1	2		++++	Secondary stage of lues at 4th mo. of preg. Inefficient treatment. Prem. labor at 8½ mo.	2240	Premature but apparently normal.	—	Remained well.		(1)	4	Neg.			Positive
1292					++++	Secondary stage of lues at 7th mo. of preg. Not treated. Full term labor.	2875	Apparently normal	—	Syphilitic eruption and Wass. ++++ at 4th mo.		(4)	7	Neg.			Positive
1296	1			2	‡	No history of lues. Not treated. Full term labor.	3493	Apparently normal	—	Remained well.		(4)	3	Neg.			Positive
1298					—	No history of lues. Full term labor. Wassermann after labor also negative.	3820	Meningocele and club-foot.	—	Remained well. Wassermann neg. at 4th mo.		(4)	4	Neg.			Positive
1299					—	No history of lues. Full term labor.	2760	Apparently normal.	—	Remained well. Wass. negative at 6th week.		(4)	5	Neg.			Positive
1335				1	++++	History suggestive of lues. Premature labor.		Still-born macerated.			Positive	(4)	3	Neg.			Positive
1337					+++	No history of lues. Full term labor.	3580	Apparently normal.	++++	Neo-salvarsan inj. Well at 6th wk. Wass. + at 4th wk		(3)	3	Neg.	1	Neg.	Positive
1386	4	1	1		++++	No definite history of lues. Full term labor.	2625	Apparently normal.	—	Remained well.		(1)	1	Neg.	1	Neg.	Positive
1403					++++	History of lues. Full term labor.	2445	Apparently normal.	—	Remained well. Treated by Inunctions.		(4)	1	Neg.	1	Neg.	Positive
1405					++++	No history of lues. Premature labor.	2676	Apparently normal.	‡	Remained well.		(4)	1	Neg.			Positive

demonstrated, if at all, only after a prolonged search. The time required for such a careful study is too great to make the method applicable for routine work."

Believing that the variation in these results made it desirable to test further the value of this means of diagnosis, I examined the placentae for spirochetes in fifteen cases in which syphilis was diagnosed either by the histologic appearance of the placenta or by the clinical evidences. The histologic diagnosis on the placenta has been entered, in the table, by number as follows: 1, normal placenta, 2, placenta showing fibrosis, sclerosis, or obliterative changes to a slight degree but within normal limits, 3, placenta showing the same changes, more marked, with more cellularity and crowding of villi, 4, placenta showing definite interstitial chorionitis, positively syphilitic.

Preparation and Technic.—Immediately after the expulsion of the placenta, a small piece about 2 cm. square through the entire thickness of the placenta was cut away and fixed at once in 10 per cent. formalin. In three cases a small piece of cord taken from the umbilical end was also similarly fixed.

After fixation for several days or more, small pieces averaging ½ cm. square, were cut from these specimens and placed in 96 per cent. alcohol for twenty-four hours, 2, transferred to distilled water for one hour, 3, transferred to 2 per cent. silver nitrate solution in dark bottles and kept in incubator at 37° C. for three days, 4, washed in distilled water for two hours with one change, 5, put in solution of pyrogallic acid (16 grms.) water (400 c.c.) and 40 per cent. formol (20 c.c.) for two days, 6, washed in distilled water one hour, 7, 96 per cent. alcohol twenty-two hours, 8, absolute alcohol twenty-two hours, 9, xylol one hour with one change, 10, paraffin sixteen hours, 11, imbedded, blocked and sectioned 3-5 microns thick, fixed to slide, paraffin removed, and mounted in balsam. Examination was made under oil immersion lens, going over each section systematically with mechanical stage. With each set of tissues a piece of known syphilitic fetal liver was treated by the same technic as a control on the method.

In the following table giving data and results, ++++ and +++ indicate syphilis, ++ strongly suggestive; + suggestive; and ‡ slightly suggestive. Babies, who remained well, remained so up to time of discharge from the Hospital, usually at the sixth week. Subsequent condition could not be followed.

It will be seen from the table that although the spirochetes were readily demonstrated in the controls, in no case could they be found in suspected cord or placental tissue on repeated examinations. In two of the cases the fetal liver was found to contain numerous organisms, easily demonstrated.

In view of these results it would seem to be futile to attempt to diagnose syphilis by the demonstration of spirochetes in the placenta by the Levaditi method. The examination of the fetal liver in a suspected case, coming to autopsy, offers a much greater chance of success, and should be made use of as a practical method.

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DISCUSSION.

DR. LESLIE L. BOTTSFORD: I haven't anything to add to Dr. Bartholomew's paper from the microscopic standpoint. According to most men the placenta offers a macroscopic diagnosis of lues; that is, a typical syphilitic placenta is supposed to be much larger and heavier than a normal placenta, the latter approaching one-sixth of the body weight of the fetus. The syphilitic placenta should weigh from one-fifth to one-quarter or one-third of the fetal weight. In all our cases here we have seldom seen a typical syphilitic placenta either in size or appearance. The syphilitic placenta is said to be lighter in color, pinkish, with a rather greasy gray appearance.

DR. UDO J. WILE: The negative results of Dr. Bartholomew and of other investigators seem to me to throw considerable doubt upon the theory of those who favor the maternal source of infection in all cases of so-called hereditary syphilis. Those who adhere to this theory believe that the placenta is syphilized from the mother and acts as a giant chancre and so syphilizes the product of conception. The fact that most of the syphilitic changes are on the fetal side and not on the maternal side, and the fact that so many of the investigations such as Dr. Bartholomew has undertaken are entirely negative, seem to me to be very much against that view and to point at least in some cases to a paternal source of infection.

DR. CARL D. CAMP: I would like to ask Dr. Bartholomew how the Wassermann reaction and the blood from the placenta compared with the report of the histologic condition of the placenta. As I

understand it, he found spirochetes in no case. I was wondering if the Wassermann reaction was sometimes positive.

DR. WILE: In connection with the point that Dr. Camp and I brought up, the explanation of positive Wassermann reactions in mothers who have given birth to syphilitic children and in whom there has never been a history of syphilis from the standpoint of clinical symptoms or signs, it is not at all impossible that there has been a filtration of complement binding substances through the placenta into the maternal blood from the infection if one can reconcile the paternal source of infection as occurring. It is an undeniable fact that most of the mothers who give birth to syphilitic children have never had active manifestations of syphilis brought to their attention and the interpretation of that was the basis of the Colle's law that a mother who gave birth to a syphilitic child could suckle that child with impunity whereas the child would infect a wet nurse who has never had syphilis. It seems to me that that clinical fact, together with these findings, is very suggestive that the complement fixation test in mothers who have borne syphilitic children in some cases may be due to a filtration of the lipoid substances through the placenta from the fetus.

DR. CAMP: How did Dr. Warthin's report compare with the Wassermann?

DR. BARTHOLOMEW: It was more frequently positive than the Wassermann. That is a point of dispute between our department and Dr. Warthin's department. He holds that these cases are truly syphilitic; that some time in the future they will develop the manifestations of lues. We have many cases in which there is no clinical evidence of lues whatever, Wassermann's negative on the mother and child, nevertheless the placenta comes back as typically syphilitic. During the entire time that the child is in the Hospital, to all appearance it is as healthy and normal as any child. It is full term, in fact, we have nothing against it except syphilitic placenta, and it was to prove that these placentae were syphilitic that I undertook to demonstrate spirochetes.

CATARACT DELIRIUMS. A COMPLETE REPORT OF THE CASES OF CATARACT DELIRIUM OCCURRING IN THE OPHTHALMOLOGIC CLINIC OF THE UNIVERSITY OF MICHIGAN BETWEEN THE YEARS 1904 AND 1917.

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(From the Clinic of Ophthalmology, University Hospital, Ann Arbor, Michigan.)

The literature as regards deliriums following cataract extractions is not very full. Practically nothing has been written in English on this subject, so important from the standpoint of an ophthalmologist, except a paper published in the *Journal of the American Medical Association* of September 27, 1913 and written by Dr. Walter R. Parker. This paper takes up eleven cases seen in this clinic and is the only reference in English on post-cataract extraction deliriums to be found in the literature.

The subject receives little note in the American Encyclopedia of Ophthalmology now being published. The substance of this reference is that the prognosis for life is usually bad when the delirium occurs. Our records, however, would tend to show that such is not the case.

Sherzog in 1842 reported a psychosis occurring after eye operations and Sichel in 1863 reported seven or eight cases of a peculiar delirium following cataract operations. The cases of the latter were all typical cataract deliriums as we recognize them and occurred in patients over sixty years of age. He attributes the delirium to homesickness and the bandaging of the eyes.

Arlt in 1874 advocated the uncovering of the unoperated eye when a cataract patient became restless before the fourth day, mentioning the fact that "in old people, much run down, timid and nervous, mental disturbances may occur the first few days after the operation."

Psychiatry throws no light on the subject except to say that the deliriums are usually a manifestation of senile dementia, often on an alcoholic basis. No classification, however, is made from a psychiatric standpoint.

Burr in the *Journal of the American Medical Association* of December 11, 1911, says that the transitory delirium following operations rarely occurs in the aged without the presence of severe arteriosclerosis and marked disease of the kidneys. He thinks that the delirium is not due to the arteriosclerosis but to poisons carried to the brain in the circulation. Others ascribe postoperative deliriums to the trauma incident to operations, the cutting of nerves, etc.

Deliriums are often reported occurring after other operations and gynecologists and surgeons are continually reporting deliriums occurring in their clinics. The literature is replete with theories and discussions as to the etiology of postoperative deliriums but no definite basis has been accepted.

Englehardt well sums up the whole situation when he draws the following conclusions from his observations: First, that postoperative psychosis occurs in individuals predisposed by heredity, chronic intoxication, grief or care; second, that the weakness incident to the opera-

tion or disease preceding can hardly be considered essential, at the most it may be considered as the determining factor in predisposed cases; and, third, that there are cases of postoperative psychosis in which an etiologic understanding is not yet acceptable.

From the findings in this Clinic alone we claim the following etiologic factors:

The first and most important factor in the causation of postcataract extraction deliriums is the age of the patient. Of the thirty patients having deliriums among the 962 cases from which this report is compiled, the youngest male was 51 and the youngest female 62 years of age. The average age of the males, twenty-four in number, was 72 and the average age of the females, six in number, was 73⅓ years. The average age for both sexes, then, was approximately 72⅓ years while the average age of the patients not having deliriums was less than 70 years.

Males are much more prone to this condition than females as 3.9 per cent. of the 610 males operated upon had deliriums while but 1.7 per cent. of the 352 females had them.

The influence of alcohol, whether taken in moderation or in extreme is shown by the fact that 36.6 per cent. of those having deliriums drank to a greater or less extent.

That syphilis apparently plays no part in the etiology is shown by the fact that so far as our records go there were no positive Wassermanns in any of our cases.

Every patient except two was American born.

Some of our worst cases were in patients of a naturally suspicious or childish disposition. Many, indeed, were diagnosed as potential cataract deliriums when they first appeared in the Clinic. One who is continually associated with cataract patients can usually tell just which patients need the most watching.

The extrinsic factors causing deliriums are numerous. Old people placed in a dark, strange room with a stranger to take care of them before they have recovered from the strain of the operation and the anticipation which is even harder, if they have any tendency towards delirium stand a much greater chance of showing it than under normal circumstances. Care of the emunctories is essential to the comfort of the patient and some deliriums appear to have been precipitated by allowing the patient to suffer an unnecessarily long time with a full bladder.

With the eyes bandaged little noises are magnified into loud ones, quick movements or unsympathetic handling of the patients, making them uncomfortable or unhappy may destroy their balance completely. Loud talking, whispering and laughing may cause the development of ideas of persecution and hallucinations. Making a patient take a medicine he doesn't want or refusing him some simple comfort has the same tendency. In fact almost anything in the way of a disturbance or inconvenience may be the basis of a severe delirium.

The symptoms of cataract delirium are simple and should never be missed by the veriest young nurse. The main cardinal signs which should always be watched for are increased irritability, restlessness, slight irrationalities of speech, purposeless movements of the hands, and incoherence.

These symptoms gradually increase in intensity or in very mild and often undiagnosed cases may be the only evidence of mental unbalance. In the more severe cases the symptoms begin usually at night on the second day after operation. They may begin the day of the operation or a week or so later but the average case develops within two or three days and usually at night. From mere restlessness the patient gradually goes on to complete or nearly complete disorientation. This is present in all degrees and even in the same case varies within a few hours or minutes. They are disoriented for time, place and person. Half our patients were completely disoriented during the course of their delirium and most of the others were partially disoriented.

Ideas of persecution develop with the disorientation and various auditory and visual hallucinations. The patient may become maniacal because of these and attempt to jump out of a window or fight those in attendance.

Some of these attacks resemble more a typical delirium tremens and in these an alcoholic history is always found.

Associated delusions and illusions are very common. In some cases the patient never recovers from these and may still be disoriented and irrational at discharge some days or even weeks later.

The average delirium lasts from one to two days, although some last but a few minutes and some last for weeks.

One patient had a cerebroarteriosclerotic attack following an active delirium. When his arteriosclerotic attack had subsided somewhat he regained his normal mental balance.

The treatment of a cataract delirium varies greatly with the individual case and it is im-

possible to lay down a specific course of treatment. The drugs most effectively used in controlling these patients are those of the hypnotic group rather than the opiates. It has been the experience of those in the Clinic that morphine, codeine, and others of that group have little or no effect on the delirium while the hypnotics such as, veronal, trional, chloral, chloretone and others have been used with a reasonable measure of success.

For a considerable length of time bromides were given routinely to all cataract patients in an attempt to avert attacks of postoperative delirium, but this measure was of doubtful value and has been discontinued.

The most efficacious prophylactic measure that has been adopted is the requiring of special nurses for all cataract cases. Under careful and skillful nursing many cases which would have developed a delirium have run a normal course. Care for the comfort of the patient is then considered the first prophylactic measure. The patient is kept in a dark room and as quiet a room as possible with the facilities we have at hand.

When the delirium is first noted hypnotics such as veronal or trional grs. X are administered in the hope of averting the attack. This is very often all that is necessary. Sometimes this dose is repeated. In case the patient becomes very unruly and refuses to take drugs by mouth we give 1/200 of hyoscine hypodermatically and after waiting forty-five minutes repeat the dose if necessary. This usually will control all but the very severe attacks.

A measure that very often helps a great deal is to remove the pad from the unoperated eye and this is usually one of the first steps taken. If the anterior chamber of the eye is formed the patient is sometimes allowed to sit up in bed or even to get out of bed. The patient is reassured in every way possible and if necessary forcibly restrained.

One of the first investigations is as to the amount of urine the patient has passed since the operation and catheterization is sometimes the means of stopping a threatened delirium.

Chloretone grs. V or X by rectum is resorted to in very severe cases.

In giving hyoscine we always watch carefully for signs of an idiosyncrasy as one of our patients who had an idiosyncrasy for the drug taught us a valuable lesson in that line.

The following tables will show the age, sex, occurrence of the delirium, character of the delirium and method of control in the thirty cases from which this report is made.

	NO.	AGE & SEX	HABITS	TIME	CHARACTER OF DELIRIUM.	HOW CONTROLLED.
I.	7769	76 F.		2nd night.	Hallucinations-auditory and visual. Delusions.	
II.	6400	78 M.		2nd day.	Disoriented for time and place-delusions. Lasted two days.	Hyoscine 1/200.
III.	5788	68 M.	Beer drinker	2nd night.	Irrational-disoriented for time, place and person. Ideas of persecution.	Hyoscine 1/100. Bromides grs. XV every 3 hrs.
IV.	5876	68 M.		2nd night	Talkative-disoriented for time, place and person. Visual hallucinations. Ideas of persecution. Lasted 3 days.	Hyoscine 1/100. Pad removed from good eye.
V.	4345	78 M.	Moderate.	1st night.	Visual and auditory hallucination. Patient developed a temp. and became more delirious. Diagnosed as senile dementia on an alcoholic basis by Dr. Barrett.	Morphine ¼. Pad removed from unoperated eye.
VI.	2126	72 M.		3rd night.	Disoriented for time and for place. Visual and auditory hallucinations. Talkative.	
VII.	746	75 F.		2nd night.	Restless and confused. Incoherent. Emotional.	Amenable to suggestion. Veronal grs. V.
VIII.	719	75 M.		3rd night.	Mild delirium. Slightly disoriented for time, place and person.	
IX.	706	80 M.	Moderate.	2nd night.	Restless at first. Then delusions and visual hallucinations. Uncontrollable. Incoherent. Completely disoriented.	Hyoscine 1/100. Veronal grs. V. Little effect from either.
X.	8/12/10	77 M.		2nd night.	Delirium increasing in intensity and lasting over a week.	
XI.	12/7/09	62 F.		3rd day.	Fairly well oriented. Suspicious. Ideas of persecution. Talkative. Senile.	
XII.	6/14/09	80 M.	Chronic Alcoholic	3rd day.	Patient threatened to have delirium tremens.	Averted by moderate doses of whiskey.
XIII.	10027	77 M.	Heavy drinker.	2nd day.	Increasing delirium lasting 1 day. Probably delirium tremens.	Trional grs. X and bromides in large doses. Large doses of whiskey.

	NO.	AGE & SEX	HABITS	TIME	CHARACTER OF DELIRIUM	HOW CONTROLLED
XIV.	10104	68 M.		2nd day.	Nervous and irritable at start. Next morning was wildly delirious.	Veronal grs. X. Morph. ⅛ Hyoscine 1/100. Morph. ⅛.
XV.	9534	72 M.		2nd night.	Restless, disoriented for time and place. Delusions. Hallucinations of simple nature.	Veronal. Hyoscine.
XVI.	9386	73 M.		2nd day.	Unruly and actively delirious. Childish and mentally unbalanced before operation. Ideas of persecution and auditory and visual hallucinations. Illusions. Delirious for two days and still somewhat disoriented at discharge.	Hyoscine 1/100. Morph. ⅛. Veronal grs. X.
XVII.	9480	52 M.		3rd day.	Disoriented completely. Ideas of persecution. Quieted at first but later became wildly delirious with delusions and hallucinations. Strong ideas of persecution caused him to attempt to jump from the window. Next morning had a cerebro-arterio-sclerotic attack after which he was confused in speech and very weak but well oriented.	Veronal grs. X. Large doses of bromides.
XVIII.	8927	51 M.	Moderate drinker.		Patient being an alcoholic developed signs of psychosis being extremely restless with a tendency towards the irrational.	Given whiskey egg nogs 4 times a day and improved within a few hours.
XIX.	11755	65 M.	Moderate.	4th day.	Increasing delirium. Ideas of persecution. Disoriented for time and place but not completely for person. Lasted two days.	Sod. bromide grs. XV q. 4 hours. Hyoscine 1/20 Trional grs. X 3 times.
XX.	11448	85 M.		1st night.	Showed mental changes becoming more and more irrational. Not hard to control at first but completely disoriented with delusions and hallucinations—auditery and visual. Next morning became wildly delirious and excited. Ideas of persecution and vague hallucinations. From then on the patient never recovered his right mind except at rare intervals and only for a short time. Was disoriented for place and time but not entirely for person. Vague ideas of persecution until discharged and continuing until his death a month later.	Trional grs. XX. Hyoscine 1/200. Catherter Sod. bromide grs. XV q. 4 hrs.
XXI.	10530	66 M.		2nd night.	Slightly delirious, disoriented for place. Easily controlled.	Bromides. Trional.
XXII.	10786	64 M.	Moderate.	4th day.	Slight delirium. Irritable. Ideas of persecution. Disoriented for time.	Hyoscine 1/100. Bromides.
XXIII.	2/25/09	81 M.		2nd night.	Slight delirium. Easily controlled.	Pad removed from unoperated eye. Propped up.
XXIV.	4/28/09	82 F.		1st night.	Irritable-restless. Flight of ideas. Completely disoriented.	Pad removed from unoperated eye. Given codeine.
XXV.	4/16/08	75 F.		2nd night.	Wildly delirious. Hard to control. Increasing delirium. Discharged against advice and before reason had returned.	Partially controlled by morph. ⅛.
XXVI.	9049	76 M.	Moderate.	2nd night.	Restlessness increasing to wild delirium with ideas of persecution and completely disoriented. Talkative. Tried to jump out of window. Lasted two days.	Hyoscine 1/100. Morph. ¼. Pad removed from unoperated eye. Chloretone grs. XV by rectum.
XXVII.	9742	72 M.	Moderate.	4th night.	Active delirium. Ideas of persecution, delusions. Lasted 5 days. Disoriented for time and place.	Veronal. Hyoscine. Morphine.
XXVIII.	10178	71 M.	Periodic drinker.	2nd night.	Completely disoriented. Ideas of persecution. Naturally bad disposition.	Hyoscine.
XXIX.	8291	79 M.		2nd night.	Unruly. Disoriented completely. Ideas of persecution. Patient had an idiosyncrasy for hyoscine.	Hyoscine 1/200.
XXX.	8256	70 F.		12th day.	Began to show mental disturbance. Ideas of persecution. Auditory hallucinations. Still mentally unbalanced at discharge.	Moved into a light place and reassured. Little effect.

Above lists include all cases prior to February, 1917.

Totals.

Males 24. Per cent. of males having delirium, 3.9%. Per cent. of both sexes having delirium, 3.1%

Females 6. Per cent. of females having delirium, 1.7%.

Alcoholics 11 or 36.6%.

Youngest male, 51. Youngest female, 62. Oldest male, 81. Oldest female, 82.

Average age of males, 72 years. Average age of both sexes, 72 4/15 years.

Average age of females, 73⅓ years.

Average length of time after operation before development of delirium, 2 to 3 days.

Average length of duration of delirium, 1 to 2 days.

The prognosis as regards the eye operated upon is usually not affected by the occurrence of a delirium as in only one case in our series of thirty deliriums was the eye definitely injured as a result of trauma caused by the patient while he was delirious.

The prognosis as regards the immediate health of the patient is also fairly good as in only one case did death occur before discharge and while the patient was still delirious. This patient died of an intercurrent pneumonia.

As before stated the American Encyclopedia of Ophthalmology states that the prognosis for life is very poor when a postcataract extraction delirium occurs, but in our whole series there are only three deaths, immediate or remote, on record and only two of these patients died in a delirious condition never recovering their mental balance. The other to die in this condition was an old physician who had had attacks of senile dementia previous to his entrance to the hospital.

The third was that of a heavy drinker and his delirium was more of an alcoholic psychosis.

SUMMARY.

The following essential facts may be extracted from this paper:

1. Deliriums occurred in 3.1 per cent. of the 962 cases operated upon.
2. The average age of the patients having deliriums was 72⅓ years while the average age of those having senile cataracts was between 60 and 70.
3. Thirty-six and six-tenths per cent. of our cases were alcoholics.
4. In no case in our series did the urine indicate a nephritis.
5. Hypnotics are the most effective drugs in controlling these patients.
6. The prognosis as regards the health or the vision of the patient is usually not affected by the occurrence of a delirium.

Despite the fact that kidney disturbance is said to be necessary in the development of postoperative deliriums we could find no cases in our records which had albumin, casts, or sugar in the urine.

DISCUSSION.

DR. ALBERT M. BARRETT: It would be very interesting to know how many of those patients showed signs of mental abnormalities before the operation. It is generally supposed that we are dealing in these conditions with the so-called dark room delirium. We see it sometimes in prisoners who are alcoholics incarcerated in a dark cell, and in certain other persons who show signs of mental abnormalities. I should be interested to know how many of these patients develop later senile dementia, as we know they often do.

DR. GRADY E. CLAY: There is very little to add to Dr. Brownell's paper. Cataract delirium in most of the various textbooks is scarcely mentioned. It is certainly a very common condition and should receive a most prominent place in postoperative treatment. During the past year we have used special nurses on all cataract cases and there has been a decided drop in the number of cataract deliriums in our Clinic.

DR. CARL D. CAMP: It would seem to me that the statement of Dr. Brownell that the hypnotics had better effect than narcotics might cast a light upon the etiology. We find that the psychoneuroses are not favorably influenced by the use of morphine, in fact they are decidedly unfavorably influenced and they are much better treated by hypnotics. I would like to suggest that he might try valerian in this connection and also the prolonged warm bath.

DR. BROWNELL: In regard to Dr. Barrett's statement, I would say that at least half of our patients when they came in were suspected of being potential cataract deliriums and showed a predisposition for it. I have no accurate figures on this point, but I don't think that there is any question but that half of our cataract deliriums are diagnosed before they go to operation.

Treatment with valerianate and hot bath has never been tried in our cases. Some of the patients are so wild that I doubt if valerianate would have any effect, but in some of the milder cases it might be tried.

REPORT OF A CASE OF BALANCE PTOSIS.

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(From the Neurologic Clinic, University Hospital, Ann Arbor, Michigan.)

The case, which I am about to present, is one showing a peculiar type of ptosis of the left eyelid and described in the Italian literature as "Ptosi Bilancia." This is of interest; first, on account of the rarity of this condition, no cases having been reported in the German, French or English literature; second, the diagnostic value of the symptom; and third, because of the physiologic problem which it presents.

This patient, age 41 years, a salesman, entered the Neurologic Clinic on January 20, 1917. At that time he complained of difficulty in walking, difficulty in the use of his hands, disturbance of vision and pain in the abdomen. His family history is practically negative. He has been married nineteen years and has two children, a boy and a girl, age 15 and 17 years, respectively. His wife is living and well and

there is no history of miscarriages. The patient had typhoid at 16, the ordinary diseases of childhood and an operation for hernia in 1898. He says he did not have the present trouble at that time. He does not drink but smokes moderately. He had gonorrhea in 1908, but he never has had a skin eruption and denies knowledge of syphilitic infection. He gives no history of an injury except that he cut his right wrist in 1904 by falling on broken glass.

Present Illness.—The patient says that he had no signs of the present trouble until June 1st, 1916 when he complained of diplopia and pain in the back. He was treated by a physician for lumbago and stomach trouble until August 10th. During this time he was becoming progressively weaker, developing difficulty in walking, numbness in the toes and then numbness in the hands and fingers. The numbness gradually crept up his body and affected the left side of his face. His vision became so poor that he could not read even with reading glasses. He says that strabismus was first noticed by his friends about August 20th. His case was diagnosed as tabes and he took his first treatment of salvarsan, intravenously, on August 21, 1916. He took two more treatments at intervals of two weeks until he had had three treatments. Between the first and second treatment the dull ache which he had in his legs changed to sharp, shooting pains accompanied by similar pains in other parts of his body. His weakness was becoming worse and his vision was not improved. He took the second injection of salvarsan at 10 A. M., Sept. 4, and about 11:30, while riding in an automobile from the doctor's office to that of an optician's, he suddenly developed ptosis of the left eyelid. He could not open his eye to have glasses fitted except by holding it open. When he reached home that evening he noticed that if he closed the right eye he could open the left, but with the right eye open he could not open the left. When he opened his left eye he says he had a feeling of dizziness and pressure sensation in the abdomen. The following week he had a great deal of trouble with his stomach, pain in the abdomen, retention of urine, constipation and loss of vision. At this time he walked with two canes. He was catheterized daily for ten days. He took his third treatment of salvarsan two weeks after the second and three or four days after this treatment he started to treat himself by taking very hot baths. From that time his general condition gradually improved and he was able to get about in three weeks, but his eye condition remained unchanged. He says he had never had blood taken for examination and no spinal puncture until he entered the Hospital.

Examination on admission to the Hospital by Dr. Camp showed that the patient was a somewhat spare individual who replied promptly to questions and seemed to be mentally normal except for some slight confusion and memory disturbance, though the latter was not appreciated by the patient. He could walk without a cane, though his gait was staggering. When both eyes were closed his gait was more ataxic and staggering. There was a ptosis of the left eye and the left eyeball showed a slight divergent strabismus. The inward rotation of the left eyeball was impaired, but other extraocular movements of both eyes were normal. Convergence in both eyes was normal. The right pupil reacted promptly to light, the left sluggishly. When he closed the right eye the left upper lid raised without effort and the eye was opened to almost the full extent. With the right eye opened the left could not be raised at all. There was no facial palsy or asymmetry and the tongue was portruded straight and showed no atrophy. There was some ataxia in the use of both hands. There was atrophy of the thenar eminence and small muscles of the right hand and the little finger of the right hand was contracted in flexion. There was numbness in the distribution of the ulnar nerve but this atrophy and sensory disturbance was probably accounted for by an injury to the right ulnar nerve just above the wrist joint. There was no atrophy nor deformity of the left hand. The biceps and triceps, knee and Achilles reflexes were absent on both sides. Plantar irritation caused no movement of the toes on the left side, but normal flexion on the right side. The tendo Achilles were normally tender to pressure and there was no objective sensory disturbance in the feet, either tactile or pain. There was no loss of sense of motion or position of the toes and no atrophy nor deformity of the feet. The umbilical reflex was present on both sides, but the cremasteric reflex was absent.

The physical condition was good and the examination of the heart and lungs was negative. An examination of the abdomen showed an inguinal hernia on the right side, but the X-ray examination of the gastrointestinal tract showed no interference with function. The examination of the blood showed 6,120,000 red blood cells per cmm., 8,000 leucocytes per cmm., 90 per cent. hemoglobin. The blood pressure was

130 systolic and 95 diastolic. The Wassermann reaction on the blood was negative. An examination of the urine was negative. An X-ray examination of the skull showed no pathologic condition. A lumbar puncture was done on his admission. The spinal fluid was clear and colorless and under normal pressure. It showed 115 lymphocytes per cmm. The carbolic reaction of Pandi was strongly positive. Nonne-Apelt, Phases I and II were slightly positive. Reducing substance was present. The Wassermann reaction was strongly positive. A second lumbar puncture was done February 20, 1917. The findings were practically the same. The Wassermann reaction was strongly positive. He was examined in the Department of Ophthalmology (Dr. Parker) February 1st, 1917 with the report of "Partial loss of power of all extrinsic muscles in the left eye supplied by the third nerve, most marked in the internal rectus. Also slight loss of power in the right internal rectus. Partial ptosis in the left eye. Well marked disseminated choroiditis probably specific."

The patient had an injection of mercury succinimid, grain 1/5 on January 28th and daily thereafter and he was able to raise the left lid about five days later. He has continued to improve since then until at present there is only a barely perceptible ptosis in the left eye and in all other respects his eyes are negative. The tendon reflexes are still lost. He has an ataxic gait which is made worse by closing the eyes, though not made worse by closing either eye alone. He has no pains of any kind at the present time.

In résumé we would say that this case shows incomplete paralysis of the left third cranial nerve, manifesting itself as balance ptosis together with other neurologic symptoms of syphilis of the nervous system and positive findings in the spinal fluid. This is quite similar to the case of "Ptosi Bilancia" reported by Artom in II *Polyclinico Practica,* 1913. The diagnosis of syphilitic basillar meningitis was made by Artom by a process of exclusion.

There were also three cases reported by Pacetti as tabes paresis and taboparesis in which there was inability to raise one eyelid when the other was open, but it could be raised when the other lid was closed. In no case of this kind has there been reported, heretofore, an examination of the spinal fluid.

This peculiar type of ptosis may be explained as a sign of syphilis of the central nervous system. It may be thought to be due to the reflex action on the part of the patient to prevent diplopia, but one objection to this latter view is that in a reflex closure of the eye there is a spasm of the orbicularis palpebrarum which is not supplied by the third nerve, but by the facial. There was no indication of facial spasm in this case. Another objection is that although diplopia is common, a balance ptosis is extremely rare. The pathogenesis of this symptom and its bearing on our knowledge of the associated ocular movements is to be taken up in another paper.

DISCUSSION.

DR. GRADY E. CLAY: I do not know just what is meant by balance ptosis. This interesting case shows a definite partial paralysis of the third nerve supplying the muscles of the right eye and the reason that this patient is able to raise the right lid when the left eye is closed is explained by the fact that an increase of nerve supply is sent to the partially paralyzed levator. The loss of vision in this case is due to the specific choroiditis.

DR. CARL D. CAMP: The case interests me a great deal. Dr. Clay's explanation, it seems to me, is a perfectly reasonable one, in fact, was the original explanation of Pacetti, that is, that there was deficient innervation to the left oculomotor nucleus, and unless the right eyelid was dropped so that all the innervation possible could get to the left oculomotor nucleus, the patient was unable to raise the left eyelid. Of course, that involves a theory of the relations of the oculomotor nuclei which is not altogether clear. The extreme rarity of this condition is, I think, very well attested. There is practically no mention of it in the literature, and yet it is such a striking phenomenon that one would think that if cases of this kind had occurred, they surely would have been reported in the literature. There is no mention of such a condition for instance in the large system of Wilbränd and Sänger on the neurology of the eyes.

MR. WILLIAM S. GONNE: In looking up a little on the physiology of this phenomenon, I discovered a variety of opinions upon the structure and function of the third nerve nucleus and I imagine it is going to be a very interesting subject to work up.

UTERINE FIBROMYOMATA COMPLICATING PREGNANCY; WITH THE REPORT OF A CASE.

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Uterine fibromyomata are in a large percentage of cases associated with sterility. They may, but rarely do, cause disturbance during pregnancy, labor or the puerperium. In large series from the maternity clinics fibroids are

found in from .7 to 1 per cent. of cases, yet they require interference in less than .02 per cent.

During pregnancy fibroids increase rapidly in size, due to the greatly increased vascularity of the pelvis. They may cause abortion, overdistension of the abdomen from rapid growth, pain, fever, and peritonitic symptoms from necrosis, incarceration, twisting of the pedicle, or other degenerative changes.

During labor fibroids remaining incarcerated in the pelvis (particularly pedunculated, intraligamentous, cervical, or adherent types) produce dystocia. Fundal growths cause no difficulty as a rule. Those of the intermediate zone are usually drawn out of the pelvis by the retracting musculature. Malpositions, and malpresentations are, however, fairly common, and placenta previa is unusually frequent.

Complications of the third stage of labor are common, namely, hemorrhage from poor retraction of the uterus, or adherent placenta.

During the puerperium fibroids may obstruct the lochial flow; they always delay involution; they predispose to thrombophlebitis, and may become infected and necrotic from the injury and bruising incident to delivery.

Of late years the cases are neither so frequent nor so formidable because most of the tumors are removed when first discovered, and further, better aseptic treatment is given at the time of labor.

The following case has been recently under observation in the Gynecological Clinic:

Miss S., age 30, entered the Hospital February 19th, 1917. Her complaint was a tumor mass in the abdomen associated with pregnancy. Her last menstrual period was July 30th, 1916, and she felt fetal movements about December 10th. The tumor was first noticed by the patient in May, 1915, as a small, round, movable mass in the left lower abdomen which disappeared, when she would lie on her left side, or back. Otherwise she was healthy in every respect, and her menstrual history was normal. The mass grew slowly until she was two months in her pregnancy, and at that time seemed about the size of an orange, and was somewhat irregular. From that time the growth rapidly increased in size, and on admission was found to occupy practically the entire left half of the abdomen, and extended from the pubis to beneath the left costal margin. The upper border of the growth was distinctly notched and it had a uniformly firm hard feel. It was apparently movable, but not freely so, due to its size, and also to the presence of a seven months pregnant uterus which was displaced to the right side of the abdomen. Upon vaginal examination the tumor mass could be felt occupying the left side of the pelvis, and could be displaced upward but very slightly. Thus far during her pregnancy the patient had enjoyed good health, and had had no unusual symptoms except for several severe, sharp pains in her right lower quadrant, two weeks previous. Physical examination was also negative in all other respects.

In making a differential diagnosis of an abdominal tumor in pregnancy, one must consider all possibilities, namely, tumors of splenic, renal, ovarian and uterine origin in particular, as well as other more rare intraabdominal growths. Here, the history was suggestive of pelvic growth and our diagnosis lay between pedunculated uterine fibroid and fibroid of the ovary. By careful blood, urine, and X-ray examination of the kidney we ruled out, as well as one may, the other possibilities. The growth simulated an ovarian fibroid greatly in its consistency, kidney shape outline and movability.

Where one is dealing with a complication of pregnancy of this type, there are two main possibilities of treatment. From its size and location in the pelvis, with the accompanying displacement of the fetus to the right side of pelvis and abdomen, dystocia at time of labor could be definitely prognosticated. Also complications prior to labor were quite possible. The treatment for these reasons was fairly well defined; first, immediate removal of the mass by laparotomy, with as little trauma to the pregnant uterus as possible, and allowing pregnancy to continue; or, secondly, to allow pregnancy to continue further toward term in the interest of the fetus, and then do a classical Cesarean, followed by the removal of the mass. In case of proper indication a Porro operation might have been done.

The first line of treatment seemed the most conservative, and according to Patton is the procedure of choice in such cases. The patient was operated upon March 2nd; the abdomen was opened by a high left rectus incision 7½ inches in length, and the tumor mass was delivered with difficulty, although not adherent. It was a large solid irregular fibroid, measuring 8 x 6 x 4 inches, and was attached to the anterior left aspect of the lower portion of the fundus by a large pedicle, about one-half inch in length. The uterus was, otherwise, normal. The pedicle was carefully dissected from the outer layers of the uterine wall, hemorrhage,

which was very brisk, being controlled by pressure, as the pedicle was too large to be clamped. The uterine wall was then repaired, the abdomen sponged dry of blood and closed in the usual manner. The patient was returned to bed in good condition, with a pulse rate of 120.

The following morning, although morphia had been administered systematically, she develepod uterine contractions. These could not be arrested. Her labor was carefully supervised as the possibilities of rupture of the abdominal incision, or uterine wound were present. Her labor progressed normally as an occiput right anterior, and delivery was accomplished spontaneously late in the afternoon. Had there been delay in cervical dilatation, or had other untoward symptoms arisen, assistance to delivery would have been rendered. The third stage of labor was also normal, and was completed without difficulty. The child was a small, poorly nourished, premature female weighing three and one-half pounds, and measuring 37 cm. in length, and survived for five hours. The patient is now rapidly undergoing a normal convalescence, and has had no complications.

According to the statistics, abortion or premature labor follow myomectomy in from 17 to 20 per cent. of cases. Particularly is this true when pregnancy is advanced more than five months and where the uterine wall is traumatized to any extent. Had there been a fair chance for delivery at term through the birth canal, either spontaneous or operative, with less danger to the mother, our treatment would have been otherwise. This tumor seemed too large to be displaceable out of the pelvis, either spontaneously following uterine contractions, or bimanually at time of labor, and was apparently a growth of the "galloping type" of Pozzi.

TRANSACTIONS

OF THE

Clinical Society of the University of Michigan

Stated Meeting, April 4, 1917

The President, CARL D. CAMP, M.D., in the Chair
Reported by REUBEN PETERSON, M.D., Secretary

REPORT OF A CASE OF FULL TERM ECTOPIC GESTATION RETAINED EIGHTEEN YEARS. OPERATION AND RECOVERY.

REUBEN PETERSON, M.D.

(From the Obstetric and Gynecologic Clinic. University Hospital, Ann Arbor, Michigan.)

The following case, because of its extreme rarity, has seemed to me worth recording:

Mrs. L. W., aged 46, married at the age of 23, entered the Clinic March 19, 1917. There is nothing of interest in her family or personal history. Her menstruation, which began at the age of 14, was of the four weeks type and has been normal. About a year ago her menstrual periods became irregular, her last period being in December.

So far as the history is concerned, interest centers in the present trouble. The patient comes to the Hospital for an abdominal tumor which has existed for eighteen years. Five years after marriage there was cessation of menstruation, the usual morning sickness and enlargement of the breasts. There was a gradual increase in the size of the abdomen until at the ninth month she was as large as a woman at term. She felt life at the fifth month but does not remember at what time movement ceased. She thought she was pregnant but never had any labor pains. Shortly after the cessation of menstruation for nine months, she began to flow regularly again. She remained the same size, that is, the size of a woman at term, for two years, then gradually became smaller. For the past six years her abdomen has been about the size it was when she entered the Hospital. During the past year she has not been feeling well and has lost ten or fifteen pounds.

Examination showed an abdominal enlargement extending from the pubes to the umbilicus. The tumor rose rather abruptly from the pubes, the highest point being half way between this point and the umbilicus. The growth was symmetrical, smooth, somewhat tender and distinctly fluctuating. It was fixed and apparently quite densely adherent to the parietal peritoneum.

Vaginal examination showed the cervix to be somewhat back in the pelvis and to the right. Posterior to the cervix could be felt an irregular, tender mass about the size of a small hen's egg apparently attached to the tumor which could be made out as a cystic mass by palpation through the culdesac. It was impossible to palpate the appendages.

Unfortunately I examined the patient before a careful history had been taken and only ascertained that she had had the tumor for eighteen years. Because of this long duration, the cystic mass, arising from the pelvis and unconnected with the uterus was thought to be a parovarian cyst. However, just before the incision was made, the assistant informed me that when the tumor appeared eighteen years before, the patient thought she was pregnant but never had had her baby, although the tumor persisted. It was then remarked that in all probability we were dealing with an ectopic pregnancy but unfortunately the tentative diagnosis was made too late to X-ray the tumor, as the results of such an examination would have proved most interesting.

Upon cutting through the abdominal wall, the fluctuating sac was found densely adherent to the parietal peritoneum, omentum and portions of the intestine. These adhesions were exceptionally dense, much more so than in the case of the ordinary inflammatory neoplasm. A normal ovary was attached to the cyst wall and the tube could be traced over the surface of the sac, showing that it was a tubular and not

an ovarian pregnancy. During the enucleation of the sac the latter was nicked in one portion, giving exit to an oily fluid of about the consistency and color of pea soup. The nodule, felt through the vagina was separated from the cyst and removed later. Considerable hemorrhage resulted from the enucleation of the sac on account of the dense adhesions and the patient was quite shocked at the completion of the operation. However, she soon rallied and has made a good recovery.

Fig. 1. Photograph of the bones of a full term fetus retained 18 years. Bones identified and arranged in their proper positions.

When the sac was cut open it was found to contain the greater portion of a fetal skeleton. Dr. Sherrick has taken considerable pains to arrange the bones in their proper positions upon this black velvet in order that they may show better. (Fig. 1.) Professor McCotter has gone over them carefully so as to identify them and see that they were arranged correctly. In his opinion the bones are from a nearly if not quite a full term fetus.

The nodule, removed separately, turns out to be a portion of the calcified cerebellum. This portion illustrates what happens in certain cases of retained ectopic gestation where the fetus is beyond the fourth or fifth month, that is, the deposition of lime salts in the fetus and the formation of a lithopedion. In other cases, the fluid in the sac is absorbed, the membranes hug the fetus from which all fluid is absorbed, giving rise to a fetal mummy. Again, the fetal mass may be changed into a kind of soap—saponification. Or, finally, as in this case, the soft parts of the fetus are absorbed, the bones becoming disjointed, "skeletonization" of the fetus resulting.

The literature furnishes many examples of what may happen when an ectopic pregnancy goes to full term, the fetus dying after fatty degeneration occurs in the placenta. Formerly, these cases were only discovered at autopsy for the patients were never operated upon. Now, the condition is usually recognized prior to the death of the fetus, and both mother and child saved by a timely operation.

I have only had time to glance through the literature but I found the records of one case, a lithopedion, where the fetus was retained fifty-five years. In many cases the sac becomes infected and after a longer or shorter time the fetal bones find their way out externally through the intestines, vagina or bladder. In this particular case suppuration did not occur, else undoubtedly the fetal bones would have been discharged, instead of remaining in the sac.

REPORT OF A CASE OF VISCERAL LUES.

UDO J. WILE, M.D.
(From the Clinic of Dermatology and Syphilology, University Hospital, Ann Arbor, Michigan.)

The case which we have to show tonight is perhaps one better spoken of as a suspected case of visceral syphilis, because we have no more than presumptive evidence that the man has visceral syphilis.

This patient, a man of 55 years of age, consulted the out-patient department of Medical Clinic some three or four weeks ago complaining of a long history of gastric disorder, frequent attacks of biliousness, sour stomach, and within the last year or two, of a progressive emaciation.

The physical examination as carried out at that time by Dr. Marshall, showed a man who might well lead to the suspicion of a neoplasm. Without being emaciated, he was decidedly

cachectic in appearance. He had the peculiar lusterless condition of the hair which goes with malignant disease, and the examination at that time with regard to his gastrointestinal tract revealed a mass in the fundus of the stomach which was tender to palpation and which showed itself in the X-ray picture as a decidedly definite functional gap in the stomach similar to that which one gets with gastric carcinoma. In the course of his examination it was revealed that he had had syphilis some fifteen years ago. The gastric disorder started in 1898. So in a man who has had symptoms of chronic dyspepsia for a long period of time there is a gradual onset of pain, of a mass in the stomach, of a slight degree of emaciation and rather a marked degree of cachexia. Obviously this is the picture of a carcinoma. On the other hand, we know that he had syphilis fifteen years ago and that he has still a ++++ Wassermann on the blood.

The question arose as to whether he might have, instead of a gastric carcinoma, a gastric syphilis, and that brings us to the discussion of syphilis of the stomach itself. I may say that there is no clinical gastropathy which may not be simulated by syphilis, and conversely, there is no syphilitic gastropathy which has a typical clinical picture characteristic of syphilis. Thus, we recognize syphilitic round ulcer with exactly the same clinical picture as the ordinary gastric ulcer. There are cases of gastric gumma which are identical in their onset, clinical course and aspects with gastric carcinoma. If either of these two processes occur in or about the pylorus, one has the picture then of stenosis and contraction exactly as one can have from the healing of a pyloric ulcer, or from a pyloric cancer. A third form of gastric syphilis is recognized as a diffuse sclerosing process which gives rise to hourglass constriction by cicatrization in the mucosa and the muscularis of the stomach itself.

With this short introduction, it is obvious that it is impossible to diagnose gastric syphilis except on presumptive evidence, or on pathologic examination either at the operation or at the postmortem. And all of the cases of gastric syphilis which have been recognized and will stand the test of a careful scrutiny are those in which the diagnosis has been made either at the postmortem or at operation, usually for suspected carcinoma or ulcer. There are, however, a large number of cases in which the evidence of a gastric syphilis is presumptive and in which all of the symptoms disappear so completely and with such a remarkable influence upon the general and local condition that one is forced to believe that they are cases of syphilis of the gastric mucosa or submucosa. We have had in this Clinic such cases and they have been made the subject of a great deal of study.

In Dr. Hewlett's clinic two years ago we had a patient in the last stages of what was apparently gastric carcinoma. He had the most severe degree of emaciation, anemia and cachexia with a large fist-sized mass in the epigastrium which from the X-ray picture was attached to the gastric wall. The man was in extremis when he came into the Hospital. In the routine examination it was found that he had a ++++ Wassermann reaction on his blood, and it seemed at least possible that he might have instead of a large neoplasm of a malignant type, one of the granulomatous type. Simply on this chance, he was transferred and treatment instituted, and he recovered completely within two or three months with complete disappearance of the tumor mass and resumption of the normal function of the stomach and restitution to complete health.

Now, such a case as this, we have before us tonight. This man's trouble became worse about a year ago. He had lost some ten pounds in weight within the last few weeks before his entrance. He had very severe pains in his stomach and the history of what might have been any form of chronic gastric disease, particularly, however, gastric neoplasm. The X-ray report I should like to read in brief. The first report showed the characteristics of a malignant defect.

"Stomach fills fairly normally, though it is narrow. There is no primary segmentation. Apparently there is a defect in the cardiac end. The greater curvature cannot be modified by manipulation but is not spastic, and is somewhat irregular. Pylorus and cap are not at all seen. This defect has all the characteristics of a malignant defect."

The patient was placed upon specific treatment and within two or three weeks he has changed very materially so far as the general condition is concerned. He has gained fourteen pounds and feels very much relieved. The pain is markedly decreased. The spasticity of the abdominal muscles is decidedly less but one cannot feel a definite mass in the stomach. However, we have never been able to feel a mass. The second X-ray report says that the comparison of the two plates leaves the operator in doubt as to whether the condition has or has not progressed

The question as to whether or not this man has gastric carcinoma or gastric lues, I do not believe is settled at all by the mere gain in weight and in general condition as the result of his specific treatment. If he has a gastric carcinoma and constitutional syphilis, then he will improve in so far as the specific infection is concerned, and a temporary gain in weight might not be unexpected at all. One must always consider too, that gastric carcinoma not infrequently occurs on the bases of previous syphilitic ulcers and in the scars of such, or indeed, a large gumma through its becoming necrotic, could easily become malignant, so that one may have both conditions present. I do not think that the temporary improvement can be regarded as anything more than presumptive evidence that the neoplasm that he has is a granuloma rather than a cancer neoplasm. If he has a lues and a carcinoma, the lues is not only in the stomch, but it is all over, in the bone marrow, spleen, etc., and one would expect that he would be in a worse condition with both diseases than he would be with only one, and if he were relieved from one condition he should improve materially. The case is one which will be proven only with the lapse of time, and if this man has a gastric gumma, he should show marked improvement, in fact a total disappearance of practically all the radiographic findings. If these disappear, then I think that in association with all of the other evidence, one would be justified in saying that this is probably a case of gastric lues. On the other hand, if he improves up to this point and the neoplasm remains as a definite mass which can be seen, then, of course, the prognosis is not materially benefited by his treatment, and the other diagnosis will stand.

Three points I think are to be emphasized in the study of the syphilitic gastropathies: First, that there is nothing at all characteristic of their picture. There is nothing pathognomonic of their picture. The positive Wassermann cannot be regarded as anything more than presumptive evidence. A patient may have both diseases.

The second point to be emphasized is that carcinoma and lues of all viscera stand in a very distinct relation one to the other, namely, that malignant degeneration is particularly likely to take place in old syphilitic strictures and recent syphilitic ulcers.

The third point of interest is that improvement, unless it be accompanied by *restitutio ad integram,* must be taken only as more presumptive of the specific nature of the disease.

DISCUSSION.

DR. Q. O. GILBERT: I remember well the one case about which Dr. Wile spoke. At that time, as I remember, we were unable to differentiate at all between syphilis and carcinoma and he was given treatment because the affection was inoperable if it was carcinoma and there was a reasonable supposition that it might be syphilis.

Two years ago I had the privilege of performing the autopsy on a man who died after two days of violent paroxysms of general paresis. At autopsy the immediate cause of death was found to be a diffuse hemorrhage into the stomach and the gross finding was seven ulcers in the stomach. One of them was perforated through so that I could stick my small finger through the hole. This had a very hard rounded edge and it was walled off by the omentum. There was no obstruction of the pylorus. The other ulcers were all hard, indurated and definitely circumscribed, somewhat different from the ulcers which I have seen in ordinary peptic ulcer cases. I would like to ask Dr. Wile if the ulcers in the cases of lues have the characteristics of ordinary syphilitic skin ulcers, because in this case the ulcers certainly had the appearance of tertiary skin ulcers rather than ordinary peptic ulcers.

DR. MAX PEET: I would like to ask Dr. Wile how he would distinguish between a carcinoma and syphilitic granuloma upon opening the stomach.

DR. WILE: I am very glad that Dr. Gilbert brought up his point. There are two distinct types of ulcer, one which simulates simple peptic ulcer, and then there are multiple ulcerative gummata which give rise to multiple syphilitic ulcers of the stomach corresponding to the nodular ulcerative syphilids of the skin. Those cases are so rare that Dr. Gilbert's case should be described if it has not already been put into the literature. The simple round ulcers are due to syphilitic endarteritis. Many of the cases have almost ruptured without a peritonitis due to the fact that the omentum has glued itself to the peritoneum. The case which Dr. Gilbert describes is one of the very few cases of the very characteristic multiple syphilitic ulcers. The symptoms of such cases are usually those of chronic catarrhal gastritis with more or less hemorrhage.

DR. GILBERT: This patient sat around in a psychopathic institution. He was very depressed and complained all the time. The sister who had seen him for a number of years said that at times he had very marked gastric disturbances of a dyspeptic order. I could get no definite history of hemorrhage. The clinical observations of the patient were very poor and meager.

DR. WILE: With regard to Dr. Peet's question, I am not prepared to answer because I have never

operated for either condition. But at the postmortem I think that one could tell rather easily by sectioning through the mass. The gummous mass, of course, does not as a rule look like carcinoma. In the one there is definite circumscription, in the other infiltration. The surface appearance of both is also quite different. The syphilitic process, of course, would start in the submucosa. I don't know that the surface appearance of the stomach without opening the organ would tell anything. I should think that one would find the peritoneal coat much more vascular in carcinoma. In syphilis the peritoneal surface is usually anemic.. Glandular nodules occur, of course, quite commonly in syphilis.

SPINDLE CELL SARCOMA ARISING IN A CAVERNOUS LYMPH AND HEMANGIOMA OF THE MUSCULOSPIRAL NERVE.

MAX MINOR PEET, M.D.

(From the Surgical Clinic, University Hospital, Ann Arbor, Michigan.)

Tumors of nerves occur very frequently, but are usually benign in character. Probably the best known type is the amputation neuroma which develops on the cut end of any large nerve and is usually painless unless caught in scar tissue. A less well known, but comparatively common type is the multiple neurofibromatosis which occurs in nerve trunks. This type is usually congenital, often shows a hereditary tendency, and the tumors very seldom undergo malignant change.

The multiple nerve tumors which occur in the skin, a condition often spoken of as molluscum fibrosum or von Recklinghausen's disease and usually congenital, also rarely undergo malignant change.

The plexiform or cirsoid neuromas, probably always congenital in origin, undergo malignant changes more often than those previously mentioned.

The type of nerve tumor found in the following case report, a cavernous lymph and hemangioma, is very rare and a rather careful review of the literature failed to disclose any tumors of this type which had undergone malignant change.

It is because of the rarity of the tumor and the few symptoms which it manifested as well as to call attention to a condition which was apparently benign until the operation revealed its malignant character that the following case is reported.

Mr. H. B., age 65, was referred to us by Dr. Hawley of Bronson, Mich. He came to the University Hospital February 17, 1917, complaining of a small lump on the left arm, three inches above the elbow, which is painful on pressure. This lump was first noticed in October, 1916, at which time it was tender on pressure. Neuralgic pains are felt over the dorsum of the hand on the radial side. The tumor has increased slowly in size and is now felt as a smooth oval mass, the size of a small hickory nut, rather deep under the skin, to which it is not in any way adherent. Slight pressure causes pain in the tumor and over the dorsum of the hand.

Because of the high blood pressure, 235, the operation for the removal of the growth was performed under local anesthesia.

On February 17, 1917, after preliminary intradermal infiltration with Schleich's solution an incision was made over the tumor and a rounded, more or less pyriform shaped growth exposed. The tumor was extremely sensitive to the slightest manipulation. This was overcome by injecting one-half c. c. of Schleich's solution directly into the musculospiral nerve above the tumor. On completely dissecting the mass it was found to embrace the nerve completely, the upper and lower ends of the growth tapering out on the nerve trunk. No nerve fibers could be seen passing in the capsule of the tumor and since many nerve tumors can be shelled away from the main nerve bundles, the hard, fibrous mass was split open longitudinally. No nerve fibers could be seen, but two cysts, one about a centimeter in diameter and the other smaller, containing a clear, slightly yellowish fluid, were disclosed in a solid mass of tissue resembling sarcoma. With the belief that the growth was malignant it was excised, the musculospiral nerve being cut about one centimeter above and below the mass. The nerve ends were united end to end by sutures of 000 silk and the line of approximation protected from the ingrowth of connective tissue by wrapping the nerve in a very thin sheet of celloidin. The wound was closed and the arm put up in the right angle position to prevent pulling on the nerve sutures. Wrist drop was of course present.

In a communication from Dr. Hawley, April 1st, he reports that the patient has had no pain since the operation, has excellent use of the arm, pronation and supination are unimpaired, and he is not hindered by the wrist drop.

If the nerve suture is successful, the action of the musculospiral nerve should return in six to eight months.

The pathologic report made by Dr. Warthin and Dr. Weller is: Spindle cell sarcoma arising in a cavernous lymph and hemangioma.

The unusual findings in this case, apart from the rare type of nerve tumor found are the late onset of symptoms, dating for only four months, although the tumor was undoubtedly congenital, and the fact that no nerve fibers could be demonstrated macroscopically, nor in the microscopic section for pathologic diagnosis, although no impairment in the muscles supplied by the musculospiral nerve existed prior to its necessary division at the operation.

The lack of pain until October last may be explained by the assumption that the tumor just before that time underwent malignant change and the consequent increase in growth pressed upon the nerve fibers.

CONCLUSIONS.

A cavernous lymph and hemangioma in which had arisen a spindle cell sarcoma, was found in the course of the musculospiral nerve, completely enveloping the nerve, but without the production of any symptoms except pain in the distribution of the nerve on the dorsum of the hand and in the tumor on direct pressure. The growth was apparently benign until its malignant character was revealed by operation. Painful tumors situated in the course of a nerve should be excised, as the possibility of malignancy always exists.

DISCUSSION.

DR. HARRY MALEJAN: I think Dr. Peet is to be congratulated on his successful operation in the removal of this tumor. In a great many of these cases which undergo sarcomatous degeneration, the function of the nerve is destroyed. It is interesting to note that in fibromata or neuromata of the nerve trunks of the arm, the median and ulnar nerves are usually affected. The musculospiral nerve is very rarely affected. I have never seen a report of the involvement of this nerve. In this case, of course, the musculospiral nerve was affected just above the elbow joint.

REPORT OF A CASE OF AMELANOTIC MELANOTIC SARCOMA.

H. M. MALEJAN, M.D.

AND

V. RUSSELL, A.B.

(From the Surgical Clinic, University Hospital, Ann Arbor, Michigan.)

In a recent report by Coley and Hoguet on ninety cases of melanotic cancer the following brief history of melanomas is given:

"Melanotic sarcoma or melanoma, one of the most common varieties of malignant tumors was first described as occurring in horses in the latter part of the 18th century. (Broguorne in 1784 and Satournelle in 1809). Lannaec was the first to write about this type of tumor in men. In 1806 Lannaec and Bayle published a report of cases of melanotic tumor of the lungs and other organs. For a number of years our knowledge of these tumors advanced but little except for the study of veterinary surgery which showed that they usually occur in animals with white skin and that the condition is hereditary and capable of transmission from one generation to another.

"The question as to the origin of these tumors is one much discussed and about which there is much disagreement. Discussion is rife even in our midst. One faction assures us that the etiology is epithelial while the other faction is equally positive that the origin is from the connective tissue. Probably both are right."

In our case, that of Mrs. E. W., the origin seems to have been from the connective tissue. The pathologic diagnosis on a gland which was removed from the neck intravitam and which showed metastases, was that the "tissue is entirely a malignant neoplasm of the type of an endothelioma. It shows no pigment." Naevi may give rise to nonpigmented sarcoma and the metastases are not always pigmented (Byrant & Buck Vol. VII, Page 387). Our diagnosis of melanotic sarcoma was confirmed antemorterm.

Our patient, Mrs. E. W., age 37, entered the University Hospital Feb. 6, 1917, complaining of constant pain in the right shoulder radiating down the arm and into the fingertips. The family history was negative and unimportant. Personal history was negative. Examination revealed the source of trouble in the right supraspinatous region of the scapula. The sketches

and photograph (Fig. 1) made soon after the entrance of the patient show the lesion better than a description. I wish here to thank Miss Margaret Miller for her kindness in making these sketches. The history of the origin and treatment is quite typical. Four years ago in June the patient noticed, after bathing, that a dark, brown, flat spot about as large as her thumb nail had developed on the right shoulder since her bath the previous week. About a year later the pigmented area began to rise up from the surface of the skin and in a few weeks ulcerated spontaneously, yielding a sero-

Fig. 1. A Case of Amelanotic Melanotic Sarcoma.

sanguinous discharge and growing peripherally always in semilunar configuration. The patient described the ulcer as being "black as ink." Pain of a cutting character began to be troublesome.

From this time on till last December the history is that of recurrent ulceration and healing. There were visits to several physicians, and treatment ranging from actual cauterization and the application of salves of varied hue, to cranberry poultices. The cranberry poultices seemed to be the most efficacious and seemed to stop the pain though, strangely enough, not the spread of the ulcerating area. At one time there was a period of healing when the scar presented red and smooth with no pigment. It remained so for a month. Then tiny black spots appeared at the border, enlarged and became confluent and finally formed a black lesion on the scar base. This broke down, crusted and ulcerated again and so on.

Two years ago a small, hard, painless lump developed on the right side of the neck. This grew gradually and when the patient came to us it was the size of an orange and very sensitive.

As has been noted before in similar cases, the very rapid decline of the patient from the time when she enterd in apparently fair health, till her death five weeks later, seems to have been percipitated by her confinement in early January. The glands in the neck grew more rapidly from September on and pain in this region and down the arm started then. In December, however, the ulcer healed and remained so. While in bed following delivery and eight weeks before death, a small lump was noticed at the vertebral angle of the right scapula. At autopsy this was as large as a man's fist. The liver, though large and tender when she came in, increased appreciably in size almost from day to day.

The clinical picture was that of a steadily progressing cachexia with much sharp pain, sometimes in the arm, sometimes in the scapular region and again in the neck. Aspirin relieved this for a while and then codein became necessary. There was an intermittent nausea and vomiting. Two X-ray treatments were given. Three days after the first one the patient had a chill followed by a rise in temperature of 102.2°. From this time on her temperature showed irregular elevations.

Two weeks before death the patient noticed that her urine on standing became very dark colored. March 12th the ferric chlorid and bromine water tests for melanine were both positive on a twenty-four hour specimen. The skin during the last week had a faint icteric tinge. March 10th the patient had hallucinations and was mentally confused until the last day when she went into coma and died in cardiorespiratory failure, March 13th.

Patient was referred to Dr. Warthin's laboratory. At autopsy the healed scar was found

to be superficial. There was a conglomerate mass of pigmented glands imbedded in the tissues low in the right axilla and attached firmly to the inner surface of the scapula. The center was necrotic. In the right cervical region and connected beneath the clavicle with a mass in the right axilla was another mass of pigmented glands, also showing areas of caseation necrosis.

The liver was enormous, weighing 4,400 grams and extending on the right from the third intercostal space to about four fingerbreadths above the iliac crest and on the left to the nipple line in the fourth intercostal space and three fingerbreadths below the costal margin. It was made up of a mass of new metastatic nodules, varying in size from that of a millet seed to a walnut, and imbedded close together in atrophic liver substance. These nodules were soft and not pigmented. The larger ones had caseating centers.

The lungs showed numerous, buttonlike, subpleural, recent, nonpigmented metastases, mostly at the bases. A few were in the lung substance. There were a few small nonpigmented nodules in the spleen, as seen on section.

The mediastinum, bronchial lymph nodes and kidneys were macroscopically negative as regards metastases. The retroperitoneal lymph nodes were hyperplastic and dark gray.

These findings group the case with the melanomas showing visceral involvement in contradistinction to the other so-called "pepper seed" variety where the metastases are numerous bluish or blackish nodules in the skin.

Because of the relatively nonpigmented character of the sarcomatosis Dr. Warthin made a diagnosis from the gross of amelanotic melanotic sarcoma. A subsequent report will be made detailing the microscopic pathologic findings of this case and of several others.

TRANSACTIONS

OF THE

Clinical Society of the University of Michigan

Stated Meeting, May 9, 1917

The President, CARL D. CAMP, M.D., in the Chair
Reported by REUBEN PETERSON, M.D., Secretary

THE ROLE OF THE STREPTOCOCCUS IN THE RECENT EPIDEMIC OF ACUTE RESPIRATORY INFECTIONS.

HOWARD H. CUMMINGS, M.D.

Executive Head of the University of Michigan Health Service.

Acute infections of the mucous membranes of the nose, pharynx, tonsils, larynx, trachea and larger bronchi are grouped and designated as acute respiratory infections. The laity has named these infections "colds," and has been trained to believe that they are the most trivial ailments that can befall mankind. It is regrettable that many physicians concur in this opinion and fail to study cause and effect. We treat a young person for an acute respiratory infection. In a few days the individual is apparently enjoying good health. One month later we are consulted because of a swollen joint, nausea and vomiting, small amount of urine, or recurring attacks of fever, loss of strength and palpitation. We search for the trouble and find an arthritis, nephritis or endocarditis. The serious disease is treated. The innocent appearing little respiratory infection is forgotten.

During the past five years, severe epidemics of acute respiratory infections have occurred each winter in this country. These have emphasized the importance and seriousness of the respiratory infections. In January, 1912, Mann described an outbreak of septic sore throat occurring in Concord, N. H. During the winter months of 1911 and 1912 epidemics were described in Chicago, Boston and Baltimore. The Boston epidemic was traced to milk. Attempts were made to find a similar source of infection to account for the Chicago and Baltimore outbreaks. It was a strange coincidence that during this same period throughout the Middle West there were small outbreaks of septic throat infections, followed by severe complications or sequelae such as general peritonitis, septicemia, arthritis, pericarditis, meningitis and pneumonia. Surely infected milk alone could not explain this. In Ann Arbor, over forty severe cases were observed and the mortality was exceedingly high. Hamburger placed the blame on the streptococcus hemolyticus.

Since 1912, each year during the months of December, January and February, and receding during March, epidemics of acute respiratory infections have swept over this country. Each year the primary symptoms have varied somewhat but the serious and fatal complications have uniformly fallen into a group of diseases caused by the streptococcus.

From 1912 to 1915 these outbreaks were described as septic sore throats, the nasopharyngeal mucosa and tonsils showing the primary changes, but early in December, 1915 and through January, 1916, there occurred throughout the United States, an acute respiratory disease so infectious in nature that within a short period it became pandemic. The health authorities in our largest city reported hundreds of thousands ill at one time and physicians and nurses labored strenuously for two months.

Because of the widespread distribution of this disease, the rapidity of onset, the similarity of symptoms and the whole course of the pandemic, physicians and the laity used the term la grippe or influenza to designate the infection. However, when examined and studied carefully there were some points of difference between this epidemic and the last great pandemic of influenza which occurred in 1889-1900.

All of the great pandemics of influenza began in Asia or the far East and traveled Westward. This epidemic was practically confined

to the middle third of North America. It occurred at a time when thousands traveled to other parts of the country to celebrate the Christmas time. The disease manifested itself almost simultaneously in all parts of this country.

The etiology of the septic sore throats studied in Boston, has been given, namely infected milk from cows with diseased udders. A small short chain, hemolytic streptococcus was found to be the etiologic agent by Hamburger, who studied the Baltimore epidemic; Capps and Davis placed the responsibility upon the same organism. Streptococcal peritonitis and septicemia complicated many of these cases and brought them to a fatal termination. Mather studied sixty-one cases bacteriologically during the height of the 1915-1916 epidemic in Chicago. Nasal discharges and sputum examined revealed a hemolytic streptococcus in forty-six instances. Green producing streptococci, pneumococci and staphylococci were found in a smaller percentage of the cases. In only one instance was the influenza bacillus found. Capps and Moody studying the same epidemic found streptococcus viridans, pneumococcus and a hemolytic streptococcus in nearly all of the cases studied. Williams of the New York Health Department found the streptococcus and pneumococcus in the majority of the fifty cases studied. All of the observers of this influenza like epidemic failed to find the Pfeiffer bacillus, except occasionally.

During the winter of 1913-1914, Dr. Warren Forsythe and the essayist studied one thousand three hundred and forty-two cases of acute pharyngitis and tonsillitis and during the height of the epidemic, bacteriologic examinations of smears and cultures being made from the throats, and grown on blood serum agar. These showed staphylococci predominating and always a few streptococci. After our attention was attracted to a fairly constant finding, our cultural results changed decidedly. We noticed small lymphoid plaques on the post pharyngeal wall. In the center of these plaques vesicles containing clear, serosanguinous fluid or pus were observed. By mopping over these with 50 per cent. grain alcohol and curetting the central lesion lightly we were able to get nearly pure cultures of streptococci from 60 per cent. of the cases.

During the so-called epidemic of la grippe occurring last winter (1915-1916), the septic sore throat was rarely seen. The nasal and bronchial mucous membranes were attacked. The tonsils usually escaped infection and the pharyngeal mucous membrane appeared injected giving a beefy red color. During January, 1916, the University Health Service staff observed one thousand and thirty-eight cases of this epidemic respiratory infection. Mr. Todd, our technical assistant, made a bacteriologic study of the nasal, pharyngeal and bronchial secretions from nearly one hundred cases. His findings will be published later but he has kindly allowed me to mention some of them. The work was begun with the idea of growing the Pfeiffer bacillus.

Pfeiffers' bacillus was found in but few cases. The predominating organisms found in cultures made from the mucopurulent exudate of the infected mucous membranes were pneumococci and various streptococci. One streptococcus form was present in predominating numbers in 80 per cent. of the cases. This was an unusually pleomorphic type as regards its grouping. It was usually seen in the nose and throat as a small diplococcus or even as what seemed to be a very short diplococcus in masses with a few short chains of 4-6 elements and in liquid media developed fairly long chains of 20-30 elements. On fresh human blood agar the colonies always developed a wide zone of hemolysis. This organism, though retaining the stain by Gram's method, showed a distinct Gram neutral tendency when taken directly from the throat or from the primary culture.

This work has been carried on throughout this past winter (1916-17) and the results are extremely interesting.

As a basis for this paper I have taken the Health Service records for the last four years, namely 1913 to 1917. During this time we have observed many acute respiratory infections. Tabulated, the diseases observed and treated are as follows:

TABLE I.

	1913-14	1914-15	1915-16	1916-17	Totals
Acute Rhinitis ..	607	796	648	726	2777
Acute Pharyngitis	784	693	600	602	2679
Acute Tonsillitis	558	496	251	295	1600
Acute Laryngitis	166	96	139	209	610
Acute Bronchitis	269	230	135	101	735

In diagnosing and recording these conditions the chief complaint and most active condition were considered in making a diagnosis. For example if a student came in complaining of a severe sore throat and examination revealed an acute follicular tonsillitis, his condition was recorded as tonsillitis, although the examination often revealed a mild pharyngitis and rhinitis.

In considering the rôle played by the strep-

tococcus in these acute respiratory infections, I have taken only those conditions which have been proven to have the streptococcus as their causal agent or which, in our own work, showed culturally the streptococcus as the invading organism.

Septic sore throats are of different types. I have mentioned the superficial form noted during the first year of the Health Service experience. In this type the involvement of lymphoid tissue of the pharynx showing vesicles containing serous or hemorrhagic fluid and pustules, was the characteristic finding. This form in our experience, subsides readily but is prone to give middle ear, mastoid and sinus involvement.

By far the most common form is the epidemic streptococcus tonsillitis. This form shows injections and swelling of the tonsil and surrounding tissues with a small amount of greyish exudate from the tonsillar crypts and at times a distinct membrane covering the tonsil in whole or in part and extending to the pillars and pharyngeal wall. This form of streptococcic infection gives marked constitutional disturbances and is, I believe, the most dangerous type, frequently being followed by arthritis, peritonitis and septicemia.

A third type of streptococcic throat infection is the acute suppurative peritonsillitis. We have observed only sixty-one cases of this type. In all of these in addition to the browny induration and swelling about and above the tonsil there has been marked edema of the soft palate and uvula. Incision gives a seropurulent discharge but rarely is there a large abscess unless the streptococcus and staphylococcus are associated.

A fourth type seen rarely is the streptococcic cellulitis of the neck. It is usually unilateral but may be bilateral. The lymph glands and structural tissues of the neck become fused in a firm indurated mass which shows but little tendency to soften. Laryngeal complications are common with this type of infection and in two of our cases the thyroid became involved.

In studying the complications and sequelae of acute respiratory infections I have used the figures given in Table I in computing percentages.

Otitis Media.—The total number of cases of acute rhinitis, pharyngitis and tonsillitis treated during four years was seven thousand and fifty-six. Of this number one hundred and seventy-two cases developed a middle ear infection or a percentage of 2.4. Capps and Miller reported six cases of otitis media complicating one hundred and seventy-three acute tonsillitis cases or a percentage of 3.4. Mastoiditis developed in fourteen and ten of these came to operation. Two of these cases were found to have sinus thrombosis. As a typical example of the otitis complications following a streptococcus throat infection I will briefly relate the following case history.

P. E., age 19, student, presented himself at the Health Service November 10, 1914, complaining of sore throat. A superficial form of streptococcic pharyngitis was found. He was given salol and phenacetin, a cathartic, advised to gargle hot saline solution and to return for observation. Two days later he returned with otitis media on the right side. He was referred to the Department of Otolaryngology. A paracentesis was made, bloody purulent discharge being released. November 15, 1916, mastoid involvement was detected. Temperature 101.2°, leucocytes 18,250. November 18, operation by Doctors Canfield and Lillie. Complete mastoid operation, ablation of sigmoid sinus and ligation of jugular vein. Patient discharged December 12, 1916, in excellent condition.

There have been no fatalities from the otitis complications.

The frequency of bacteremias in acute tonsil and pharyngeal lymphoid infections has never been worked out in a satisfactory manner. Most observers agree that the frequency is great. The tonsil is considered the usual portal of entry into the blood stream. Once having gained entrance, Elsner says, "there is always danger of septic deposits in organs which present changed or diseased surfaces to the blood or lymph stream." Rosenow called attention to the frequency of involvement of the surrounding structures of the joint following streptococcus throat infections.

Arthritis and Peri-arthritis.—In our series of sixteen hundred cases of tonsillitis, thirty-four or 2.1 per cent. developed joint complications involving most frequently the ankles and elbows. Elsner states that in epidemic tonsillitis, arthritis complicates 10 per cent. of the cases and occasionally leads to suppuration. This percentage is higher than in our series covering four years, but in the last two weeks we have observed five cases showing joint involvement. Three cases occurred in patients having a streptococcic tonsillitis associated with a scarlet rash. Two of these cases proved fatal. Acute polyarthritis was observed in twelve of the thirty-four cases.

It has been stated that acute tonsillitis is coincident with the arthritides in from 70 to 80 per cent. Our experience has firmly fixed

in our minds the idea that acute flareups of chronic tonsillitis usually preceded the arthritis involvement. The index cards of most of our cases of arthritis are similar to this one:

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Nov. 22-13—Pityriasis Rosea-Referred to Dermatology.
March 23-14—Acute tonsillitis and pharyngitis.
Oct. 27-14—Acute tonsillitis—Referred to Otolaryngology. Advised to have tonsils removed.
Nov. 18-14—Acute tonsillitis.
Dec. 16-15—Acute tonsillitis.
Dec. 19-15—Acute tonsillitis and frontal sinusitis.
March 3-16—Acute tonsillitis and polyarthritis. Taken to hospital. Tonsils removed after three weeks. Completely recovered.
March 15-17—Stomatitis.

We have classified as rheumatism those cases having stiff and painful joints, but not definite joint lesions following acute throat infection. Torticollis, lumbago and myositis have been grouped in this class. The following table shows the frequency of these sequelae:

TABLE II.

Rheumatoid Complications.	Number of Cases
Mild arthritis symptoms	120
Torticollis	42
Lumbago	103
Myositis	196

The frequency with which recurring attacks of these rheumatoid symptoms in students having chronic tonsillitis occur, and the absolute disappearance after tonsillectomy, strengthens our belief that these are manifestations of streptococcic activity in the joints and muscular system. The researches of Poynton and Paine also Rosenow's work prove this experimentally in animals.

Before leaving the discussion of arthritides, I wish to sketch briefly the histories of four students seen during the month of March.

Case 1. N. H. Postgraduate student, age 28, was taken ill March 2, 1917, with a mild pharyngitis and rhinitis. In spite of the usual treatment the temperature rose each afternoon to 102 or 103°. On the fifth day of his illness the left knee became swollen and painful presenting a typical picture of a peri-arthritis. No other joints have become involved and although confined to his bed, he is convalescing nicely.

Case 2. P. W., age 19. Freshman student. Was seen in his room on Tuesday, March 6, 1917. He complained of a sore throat. There was a small amount of greyish exudate on the tonsils. This tonsillitis cleared up in three days but on Saturday March 9, 1917, he complained of a painful right ankle joint. A diagnosis of acute articular rheumatism was made and the young man was taken to the University Hospital. The following day, at his mother's request this student was transferred to a private hospital. At this time his left elbow showed a marked peri-arthritis and lymphangitis. His temperature was 101.6°, pulse 100 and general condition fairly good. The leucocyte count was 12800. At 3 a. m. Monday morning, March 12, he became extremely irritable, restless and irrational. Within three hours his right elbow became involved, his temperature rose to 105.2° with pulse feeble and extremely rapid. He died at 1:30 p. m. Two hours before death blood cultures were taken. These gave a growth of hemolytic streptococci two days later.

Case 3. Mr. W. Student seen March 4 by Dr. Waldron. He was suffering from a severe sore throat. The next morning a diagnosis of scarlet fever was made. This young man was seriously ill while in his room and showed numerous casts and but little albumin before being moved to the contagious hospital which was done as soon as a vacant bed could be secured. His course while in the contagious hospital was practically the same as in Case 2. A severe peri-arthritis and lymphangitis of the right elbow and arm developed and he died of a septicemia.

Case 4. P. P., age 23, senior literary student was taken ill March 10, 1917, with a severe tonsillitis. Two days later he developed a scarlatinaform eruption and was isolated in his fraternity house. As soon as a bed could be provided in the contagious hospital he was moved. On March 21 he developed a severe laryngitis, had difficulty in breathing and on March 24 showed evidence of involvement of the thyroid gland. On March 26 the right olecranon bursa became involved and was opened on the evening of the same day, about one teaspoonful of seropurulent material being evacuated. Since that time the temperature has fallen and there is a tendency for the septic process to localize in the joint and thyroid. Discharged April 12, 1917.

Heart.—Endocarditis is reported as a complication of arthritis in 34.3 per cent. in children (Pribam). In our series of thirty-four arthritic cases eight or 23 per cent. developed cardiac complications. Following throat infections without arthritic complications the following lesions have been diagnosed:

TABLE III.

	Number of Cases
Mitral insufficiency	53
Aortic insufficiency	11
Mitral stenosis	4
Aortic stenosis	4

The frequency of valvular lesions in young adults is amazing. About 4 per cent. are found upon routine physical examination to have evidence of cardiac damage and fully 80 per cent. of these give a history of attacks of tonsillitis, arthritis or scarlet fever.

Within the last month, two students have developed severe cardiac complications. The first developed a severe myocarditis five days after his tonsillar infection began. The second developed a pericarditis within six days of the onset of tonsillitis.

Brain and nervous system complications, such as meningitis and neuritis have not been met in our series; however, delirium and extreme alertness and irritability have been observed in many cases during the acute stage. In four fatal septicemias this marked irritability has been the first indication of invasion of the blood stream. I consider it a very valuable prognostic sign.

Pulmonary complications have been few; only seven cases of bronchopneumonia developed after these acute respiratory infections, unless we include several hundred cases of severe bronchitis occurring during the epidemic of 1915-16, which showed no definite involvement but had bloody sputum, containing streptococci and pneumococci. Two students had pulmonary hemorrhages during this epidemic. Tubercle bacilli were found in the hemorrhagic sputum although subsequent physical examination and X-ray examination failed to disclose the area involved.

In all streptococcic infections the kidneys take the major part in eliminating the toxins and recently pathologists have come to believe that the streptococcus in the blood stream actually passes through the kidney and is excreted in the urine.

Dr. Drury of the Health Service Staff is studying the frequency of kidney involvement following tonsillitis.

It is to be expected that the kidneys would be damaged frequently by the toxins and organisms excreted. However, the very common finding of albuminuria following tonsillitis, does not mean nephritis. This albuminuria is a very transient finding but should always lead to repeated examinations.

In our series of 1600 cases of tonsillitis thirty cases of nephritis were observed or 1.8 per cent. Two of this number were of the acute hemorrhagic type. Acute parenchymatous nephritis was the more common.

Two students died from appendicitis and peritonitis of streptococcic origin. These fatalities have made me extremely cautious in advising an appendectomy where an attack occurs during an acute throat infection.

I realize that this paper deals more with the statistical data than with symptoms, treatment and results; so that conclusions of value to the practitioner are not apparent. However, I have tried to emphasize the importance of supposedly trivial respiratory infections.

A few impressions drawn from our observations might be fitting.

1. All sore throats are potentially dangerous to health and life.
2. Streptococcic bacteremias are apparently frequent incidents in respiratory infections.
3. The tonsils and lymphoid tissues are the usual portals of entry for pathogenic streptococci.
4. Damaged or diseased surfaces are most often attacked by these blood invaders.
5. Absolute rest, stimulative measures and aiding of elimination are of primary importance in treating the acute conditions.
6. Possibly too conservative an attitude has been taken in the past about incising localized streptococcic foci.
7. Removal of diseased portals of entry is the best preventive measure.
8. Alertness and irritability, denoting central nervous system irritation due to toxins are grave prognostic signs.
9. Careful observation of the kidney function during these diseases is of great importance.

DISCUSSION.

DR. R. BISHOP CANFIELD: I think this is a very admirable and very timely paper. As Dr. Cummings read it so many things occurred to me to say that I soon found that it would be quite useless for me to attempt a comprehensive discussion of it.

I have had the opportunity of seeing some of these patients with Dr. Cummings and have talked over the situation with him many times. I have for some years been firmly of the opinion that the majority of infectious diseases are contracted through the throat, that is, through the lymphoid tissue of the throat, and I have yet to be shown that I am wrong in thinking that all infectious diseases are contracted through the lymphoid tissue. Naturally the throat, the buccal cavity, the nose and the nasopharynx, composing the cavity most intimately connected with the outside world, are the cavities through which the infection usually enters the body. If we include not only the upper end of the respiratory tract, but the orbital tissue, the lymphoid tissue of the urethra and rectum and vagina, we find difficulty in imagining another portal of entrance except through accidental wounds of the skin. The more I think of these epidemics of throat infections, the more I am convinced that in the pathologic condition of the nose and throat we have the pre-

disposing factor in infection. What the character of the infection will be depends to a considerable extent upon the strain of bacteria then prevalent in the community, the resistance of the patient, and the pathologic condition in his nose and throat.

In certain of these epidemics bacteriologists find in a great majority of cases bacteria of very similar characteristics. In one such epidemic the complications are very similar. In another complications of a different kind are found in the majority of cases. This is borne out very conclusively by Dr. Cummings in a large series of cases. This epidemic, for instance, of so-called scarlet fever which is prevalent at the present time, bears out this statement. I am strongly of the opinion that there are many mistakes of diagnosis being made. I think that many of these cases of scarlet fever are due to the streptococcus which in this epidemic is producing a rash of the character which we usually ascribe to scarlet fever. Many authors have stated that scarlet fever presented many different characteristics in different epidemics and in different patients, going so far as to say that scarlet fever may be present without a rash, without sore throat, without temperature, and without any of the symptoms that we usually ascribe to scarlet fever. In other words, they are describing a condition which is diagnosed according to the characteristics of the epidemic then present. For instance in one of the cases which Dr. Cummings mentioned, the patient had a streptococcic throat and a septic rash, fever and sickness. Naturally his case was diagnosed as scarlet fever. It would have been a mistake not to have so diagnosed and treated him, but I think it becomes a grave question as to whether such a patient should be isolated with patients who are known to have scarlet fever. Although I didn't see that case early, I am very skeptical about the diagnosis of scarlet fever. I am skeptical also of the diagnosis upon another patient of the four cases which were seen this month. I think it is altogether doubtful if a scarlet fever patient has a sore throat and then a septic elbow. I think such a patient has a streptococcic throat, a septic throat with an embolic focus in the elbow.

Dr. Cummings mentioned several types of septic sore throat. It seems to me they might be divided into throats with, first, edema as the chief characteristic, second, one in which infiltration is the chief characteristic; third, one in which the throat presents the appearance of tonsillitis; and finally, one in which the symptoms are those of a pharyngitis or a laryngitis.

Now as to which of these classes of cases is the more dangerous, there may be some room for discussion because the complications from these four classes seem to differ. For instance, the class of cases in which edema is the most marked. Such patients are very likely to suffocate as a direct result of the edema, the edema spreading down into the larynx and trachea. Such patients usually get well but if this edema increases they die as a direct result of their suffocation. Such patients do not become septic. Death is due to mechanical causes.

The cases in which infiltration is the most marked characteristic get into very bad condition because of the pressure on the trachea. Such cases are Ludwig's angina probably.

Those cases of pharyngitis in which the mucous membrane of the pharynx is glazed and the mucous membrane of the larynx and trachea are both glazed, usually show slight superficial ulceration. The practitioner is liable to say to the patient, "You have an ulcer in the throat." He really does not see an ulcer. Those patients in which the mucous membrane of the soft palate, uvula and pillars disappears in patches are very likely to become septic and they hang on for weeks and even months, and occasionally die.

The cases in which the chief characteristics are those of a tonsillitis are the ones which in my opinion frequently develop joint symptoms which we consider characteristic of tonsillitis and later after the patient is well, develop a heart complication, and frequently kidney complications. Such patients are prone, as Dr. Cummings has said, to repeated attacks during some one of which serious complications arise.

I think that an important prognostic point is whether the patient appears sick. Now in a case of simple tonsillitis the patient has a sore throat, infiltration of the glands of the neck, large red tonsils and a fever of 104-105°, and he feels sick. Such a patient does not impress me as being desperately sick as a rule. He certainly is uncomfortable and is sick, but not desperately sick. But the patient who has a little temperature, a glazed throat with superficial losses of the mucous membrane of the palate or pharynx or false cords of the larynx, looks sick. He has an anxious and apprehensive expression, he is irritable and he shows a positive blood culture and develops a meningismus and occasionally a meningitis. He is really sick, much sicker than is the patient with an edema and infiltration of the larynx who is in danger of losing his life from obstruction.

The treatment of these patients, no matter to what class they belong, certainly is disappointing Usually we are content to treat them symptomatically, as Dr. Cummings has said, with rest in bed and good nursing, an ice collar and some phenacetin, salol or aspirin, and hope they will get well. In many places they have been very free with the use of serums and vaccines, in almost all cases without much success. However, in some cases, two or three of my own, a brilliant success has seemed to follow. if not to be due to the polyvalent serum of Sherman. I have not been very fond of Sherman's productions, but in a few cases their use seems to have been followed immediately by an improvement. There may be some connection between that and the fact that a patient of mine who had his tonsils taken out had fortified himself before the operation with a huge dose of Sherman's serum. He had absolutely no sore throat after his tonsils were taken out. He had a membrane which almost filled his tonsillar fossae after his operation, but no sore throat and no difficulty after his operation.

Dr. Cummings' statement that he hesitated to recommend an appendectomy during a throat infection I think is very wise. Surgical interference of any kind in a streptococcic throat infection is a very dangerous thing. The unnecessary interference with a localized streptococcic infection is more dangerous than we know anything about. A very slight incision in a little furuncle at the tip of the nose caused the death of Dr. Deckman of the Mayo Clinic. That may be due to the fact

that there is a very intimate relationship between the lymphatics of the nose and upper respiratory tract with the lymphatics of the base of the brain.

I have observed a very interesting relationship between infections of the throat and infections of the appendix. For instance, a patient who had had a chronic appendix with attacks repeated at more or less regular intervals for quite a few years had her tonsils taken out and now for a couple of years has not had an attack of appendicitis. The interesting work which Rosenau has done on the throat streptococcus and the streptococcus found in the gall bladder and appendix are interesting. I honestly believe that the more we think about it the more we shall be certain of the statement that it is through the buccal cavity and nasal mucous membrane that most of the infections enter the body.

DR. WM. BLAIR: I was very much interested in the paper of Dr. Cummings and also in the very able discussion by Dr. Canfield. There is a phase of the question concerning the relationship of the practicing physician to his patients during the time of these particularly virulent infections of streptococcus that perhaps needs a moment's discussion. Something has been said by both the gentlemen about operating on cases of appendicitis during the time of infectious throats. I don't believe that any operation except emergency operations or operations of extreme necessity should be done in any hospital so far as it is possible to avoid it during the time that we are having a great deal of streptococcic infection. It is bad enough to have to do the emergency operations. At a time when the whole country is literally flooded with the streptococcus we should avoid doing anything that gives a chance for entrance of the infection, particularly at a time when the resisting power is lowered following a surgical operation.

Another matter which has appealed to me very strongly is the proper conduct of the obstetrician during the time of the streptococcus stress. The probabilities are that when public health is reduced to a science one or two physicians will handle all such cases in a community and a man going from a scarlet fever to an obstetric case will be considered culpable. On account of a number of confinement cases upon which I had been engaged I have refused to take any scarlet fever cases up to within the last few days during this epidemic, although some of them came among my best families, because I thought my duty was with the confinement cases which I had promised to take care of, and it would not have been fair to take dangerous cases. I believe that the general practitioner who is handling the ordinary run of non-infectious cases as they come along, and particularly some surgical work and obstetric work, will not only be relieved from caring for obstetric cases, but the authorities will provide some one man to do all of the obstetric work, and thus keep the infections isolated.

This present attack of scarlet fever, if we may call it such, is a peculiar one and one which has been widely predicted by reason of the great prevalence of streptococcic trouble which we have been seeing during the past few years, particularly the streptococcic adenitis in children, and the streptococcic forms of tonsillitis and septicemias and erysipelas. All these have been very much on the increase in general practice during the past two years. It is quite rational to believe that, following an increase of such troubles, we should have such trouble as we are having now.

Among the cases of streptococcic disease which I have been brought into contact with and which I have turned over to other physicians up to the past ten days not a single case has shown a typical scarlet fever tongue. The eruption has been atypical, some of them have had no fever, some have not desquamated afterwards. The whole arrangement of them seems to be atypical. A large number have started with respiratory troubles such as mild bronchitis, and within a few days this atypical punctiform eruption has appeared, followed by desquamation. When we get this thing properly classified I believe we are going to find that it is just as important from the standpoint of public health to isolate cases as it is to take care of tuberculosis and smallpox and cases of the more severe forms of infection.

DR. FRED R. WALDRON: My observations have been very similar to Dr. Blair's. I don't think any one would pretend to diagnose scarlet fever in these cases. I have not seen a typical throat or a typical tongue. I have seen generally a general adenopathy, and a posterior nasal bloody discharge. In one case there were more casts in the urine than I have ever seen in urine before, with practically no albumin at all. He had the rash when I saw him. These cases are streptococcic cases as far as I can see. I have not seen enough real scarlet fever to say, but the classical description of scarlet fever does not fit any of the patients I have seen. They have an absolutely typical scarlatinal rash but the brother who slept in the bed with one of my patients when he had the most brilliant rash developed no fever. We quarantined them as scarlet fever. I have not seen a typical case of scarlet fever among the entire series. They have been cases of posterior nasal infection, generally adenopathy and scarlatinal rash. The distribution of the rash has been pretty typical. I have not seen a case which I would call typical scarlet fever.

DR. JAMES F. BREAKEY: I should like to express my appreciation of Dr. Cummings' paper. I think it represents a very thorough statistical study which ought to be quite worth while. I suppose I would be guilty of more or less heresy to say in the present day and age that I doubt whether there is such a disease entity as scarlet fever. Not that there wasn't at one time. There is no doubt but what we have evolutionary types of various bacteria and that we have different clinical manifestations at different times during the course of an infection from the same germ. And you can recover both culturally and clinically quite different types of the germ at different times. As has been previously said tonight. I think that there is only one thing for a health officer to do and that is to classify every suspicious case as scarlet fever. However, I think that there will be an improvement upon the system if we abolish diagnosis. I don't see the necessity of naming a child upon the day of its birth. There are a lot of useless laws regarding medical matters. If you recognize that you have an infectious or contagious condition and placard it "Contagious Disease," you are accomplishing quite as much for the public good and you are wasting no time in waiting for a diagnosis. There is absolutely no doubt at all but

what, especially at a time like this, that many of the undoubted streptococcic diseases, which are not scarlet fever, are more of a menace to the public health than many of the so-called cases of scarlet fever. So if we could institute compulsory reports of all acute febrile conditions aside from acute toxemias and have them placarded early and have them quarantined and segregated I think we could accomplish much more than by waiting for a typical erythema or desquamation to make a diagnosis.

As Dr. Canfield has said, I think we do wrong in sending a suspicious case into a contagious discase hospital unless each and every one is absolutely segregated from all others, because cross infections are bound to occur. If you put a patient in there with a bad streptococcus infection and he there develops a new infection, there is considerable personal harm done to the patient without any particular benefit to the public at large. I have not seen many infectious diseases lately, though I have had a considerable experience in suspicious diagnoses. I know in my own family I sent two maids out for the most beautiful scarlatiniform eruptions and the children had been playing with them right along, but they didn't manifest any symptoms of true scarlet fever. One of the twins had a slight erythema eight or ten days afterwards and I placarded the house immediately with a scarlet fever sign in order to avoid criticism. I don't believe that we ever had a case of scarlet fever in the house.

Dr. Raymond A. Clifford: I would like to ask Dr. Cummings in regard to the new work which has been done on the bacteriology of scarlet fever.

Dr. Cummings: I might say that Mallory some years ago claimed to have found the germ of scarlet fever, and just recently there has been a sort of revival of his idea by several workers. They describe a peculiar small diplobacillus. This same diplobacillus can be produced on solid media by planting this hemolytic streptococcus. On beef tea it grows in chains. It is pleomorphic. One man grows it as one form and another man grows it as another form. One says it is a small staphylococcus. Another says it is a diplococcus, and another calls it a diplobacillus. Mallory has produced this diplobacillus as a causal agent of scarlet fever. When they all get together they will find out that they are dealing with the same organism and that is what Mr. Todd is doing in his paper.

Dr. Harold I. Lilly: I really have nothing to add to what has been said. Dr. Cummings and the other gentlemen have covered the subject very thoroughly.

I would like to add something in regard to what Dr. Blair has mentioned, that is, the occurrence of glandular conditions in children. Fortunately, while I was located in Chicago, I had a great deal to do with children and ran into several epidemics of this gland condition where the patients were very sick. Dr. Baxter of the Children's Memorial Hospital has reported from his private institution-practice some 150 cases where all their grandular conditions have originated from the nasopharynx. If you have noticed, most of the cases have some nasal discharge at the time of the glandular disease. Although they may not have anything appearing in the throat, still you can isolate streptococci from the nasopharynx.

It occurred to me during the discussions and the original paper, that it all has emphasized the importance of the throat infection as Dr. Canfield has said, and the importance must lie in not considering the affections too lightly. Any sore throat is a latent menace to the health of the patient. When the condition in the course of two or three days, does not show signs of improvement, we must begin to look for complications, for things which would set him back. I was very much surprised in my clinic last year to see people who were living in poor environment develop kidney complications with sore throats, especially in peritonsillar abscesses or quinsy. The patients did not look well, and when you examined the urine you would find a severe nephritis. That impressed me very strongly last winter and I collected a series of twenty cases in which I have statistics. This work has not yet been published.

Another thing which occurred to me was the fact that during these cases of obstruction in the pharynx and larynx due to edema, one must not be too quick to intubate in a laryngitis or too quick to enter the trachea because in these cases very grave damage may be done by the pressure that you may produce by the intubation tube and by opening up a new avenue of infection when the tracheotomy is done. These cases respond about as quickly to other treatment. I had the opportunity of seeing a friend of mine in Chicago come down with a severe throat infection and within eighteen hours he had a severe laryngitis and tracheitis with marked dyspnea. Fortunately he recovered rapidly under steam tent inhalations, and it was very gratifying to see the quick relief from the ice collar and the steam inhalations. Furthermore, the laryngologist is naturally the last man to see these cases, and they are either in grave straits, or are seen for the satisfaction of the patient who wants consultation in a delayed case of convalescence.

I believe that the work that the health commissions and school physicians are doing, especially in children in the school examinations in Chicago, is a great work. They are lessening the mortality and the severity of these conditions by not allowing patients to come back to school within a certain time. They have two or three different types of quarantine which they designate A, B, C and D. The school authorities can keep any child out of school with any sort of sore throat until he is sufficiently convalescent.

I might add that I was associated indirectly with the work that Dr. Capps of the Billings staff did in Chicago last winter. The patients were thoroughly worked over. Nothing was left undone in the work on these cases and they afford a very authentic report. Dr. Capps is a very thorough man and a man of very high ideals.

In regard to any medicinal treatment, I don't know what the action of salol and phenacetin is on the throat, but I know that the ward cases which came into my clinic last year were kept under observation with an ice collar and very frequent hot gargles. There was no routine medicinal treatment. I think the hot saline gargle is as efficient as anything we may do in throat infections. I don't believe a gargle is any good without heat. The hot gargle relieves the tension and has the mechanical effect of cleansing the mucous membrane. All lymphoid

tissue is more or less cryptic and there is a tendency for the material to collect within the crypts. This material is forced out of the crypts and the mechanical cleansing I believe is of a great benefit.

DR. FRED R. WALDRON: Dr. Lillie brought to my mind the kidney complications. I have only seen albumin in one case that we have had. It has happened that every case of idiopathic Brights that I have ever seen has been preceded by tonsillitis, and it is generally a tonsillitis which has not been seen by a physician at all, a very light tonsillitis.

DR. R. BISHOP CANFIELD: I believe that every case of disease, aside from the purely surgical sicknesses, is preceded by a sore throat. All the cases of pneumonia are preceded by sore throat. An acute sore throat precedes bronchitis, acute nephritis, acute gall bladder cases, and all acute conditions, even typhoid. I have an idea that the infection in typhoid fever might very well make its entrance through the lymphoid tissue of the throat and reach the glandular tissues of the neck, passing down through the chain of lymphatics that passes through the diaphragm and reaches the lymphatics of the peritoneal cavity. We don't know much about what happens during the two weeks of incubation in typhoid fever. Autopsies show that the oldest pathologic changes in typhoid fever are not in the Peyer's patches but in the lymphoid structures of the mesentery which are in fairly direct communication with the lymphoid tissues of the neck.

DR. FRED R. WALDRON: Isn't there a typhoid septicemia preceding the symptoms?

DR. R. BISHOP CANFIELD: Yes, there is an ambulatory type. The bowel becomes infected secondarily from the lymphoid tissues of the mesentery. I don't think it is going too far to say that the patient becomes sick not as a result of drinking typhoid water which passes into his stomach, because the chances are very much in favor of the typhoid bacillus being destroyed in the stomach, but it is quite possible that this is a lymphoid infection. I have been trying my best to have an opportunity to take out some cervical glands in a typhoid fever case to study this question. But, of course, it probably doesn't make any difference to the patient how he gets the disease, after he has it.

DR. LILLY: I might add that during the recent epidemic of anterior poliomyelitis in Chicago a review of the patients at the Chicago Hospital shows that the tonsillectomized patients had very light attacks, while the cases of bad tonsils had the worst attacks.

DR. R. BISHOP CANFIELD: In the epidemic here of two years ago, only one of the patients had had his tonsils taken out.

DR. JOHN A. WESSINGER: We are getting into deep water in this discussion. But there is a large grain of truth in what Dr. Canfield says, if you make close observations of a large series of cases. I am coming to the belief that a great deal of the diseases which the human flesh is heir to enters through the lymphoid tissue. In our last typhoid epidemic in many cases the incubation period was two months. I believe that a person can become infected with typhoid fever and be almost immune so that it takes a long time for the bacilli to grow. The present condition among us, undoubtedly, in my opinion, enters through the throat, even though you don't get a sore throat always. It is not always necessary. We are having atypical cases of this condition, but from a public health viewpoint I have to handle it as scarlet fever. You see case after case that has no temperature, very little or no eruption, and yet that patient desquamates from head to foot. Then you see another series where the patient comes down with a sore throat and high temperature and lobster skin without any desquamation whatever. Such things are difficult to explain when we hold ourselves to the classical scarlet fever. I am always afraid of scarlet fever because we don't know where we are with it. We have epidemics in which nearly every case is fatal. Then we have an epidemic with no fatalities. This has been the battle of Dr. Cummings' life and of my life. He has written an admirable paper and we are agreed upon these points and we must handle it from a public health viewpoint at the present time. As Dr. Waldron said, both of us agreed that a certain case was not scarlet fever, but I put a scarlet fever sign on the house.

Dr. Breakey's idea is a good one about a placard on the house stating. "Contagious Disease Within." But if I did it, the people would bother me to death asking about it and I wouldn't get any rest at all until it was diagnosed. However, I believe that is the safe and scientific thing to do.

DR. JAMES F. BREAKEY: Regarding the contagious disease sign, if you are called to placard a case with a scarlet fever sign and the case is pretty well along in its course and the sign comes down in ten days, the next person who has a scarlet fever sign up and has to have it up for six weeks wants to know why he can not get out of quarantine as quickly as the other fellow did, whereas if you say simply, "Contagious Disease" no such difficulty can arise.

DR. JOHN A. WESSINGER: The State Board of Health demands that we keep the minimum quarantine of thirty-five days in scarlet fever cases. I have had several fights with the Board about that. I don't see any reason for keeping a sign up after the patient has completely recovered from the disease, and I have tried to be fair and sensible about the matter and let patients out as soon as the danger has passed. There is no sense in having a definite period of quarantine for a case of any disease anyway, especially scarlet fever where the cases vary so in nature. Now I write under the case in my report to Lansing, "Very mild cases." and get away with it without any controversy.

DR. RAYMOND A. CLIFFORD: This discussion has brought out a great many interesting points. It has been mentioned here tonight that something else is necessary to decide the infection, and that is the resistance of the patient. As regards the general practitioner, I believe that we shall always have scarlet fever or its equivalent. But the general practitioner in relation to the people that he meets and knows intimately has a work he may perform and do the community more good than in just fighting disease when it is present and that is to teach the patient how to keep their elimination active. I believe that if every individual knew about these functions that the infections would have very much less material to get hold of, and when you are talking about

prevention, I believe that is the foundation for all of it.

DR. ROY A. BARLOW: I don't feel that I am in position to add to the discussion. I was fortunate in seeing two of the four cases cited by Dr. Cummings. They were streptococcic infections and it was extremely interesting to note their rapidity and virulence. The man with the infected elbow, who later died, developed an acute ear during the night. I saw him the day following and there was sufficient drainage. It was impossible to see how much destruction was present at that time, but in twenty-four hours the entire tympanic membrane had been eroded leaving nothing but a thin shell of the membrane around the annulus. This happened within forty-eight hours of his first pain in the ear. That was an extremely instructive thing, the rapidity of the infection in that case.

It has been worked out by Wright and Smith of New York that the lymphatics of the neck empty rather freely into the thoracic duct and perhaps that will throw some light upon the fact that we get the tonsillitis, the infection entering the blood stream and then is carried to the different foci.

DR. G. M. HULL: I didn't come here to talk. Dr. Cummings must know that I was greatly interested in his paper or I would not have come out this kind of a night to hear it. I think that any one who has been through the amount of sickness of this kind which we have had would certainly be interested in it. No one has said so far what they do for it. I am situated so that I don't have a pathologist at my elbow. I have to take the cases and do the best I can. I have been listening for somebody to tell me what they have been doing with them. Some of these people might like to know what an average country doctor does for these cases. I don't believe there are any two cases of the disease which are alike. Some are not sick, others are sick from the start. I don't think that you can have a routine line of treatment for them. Mine runs about the same way. I start in with salol and phenacetin. Speaking of rheumatic arthritis, all this winter about as soon as I have gotten the fever broken I pushed the salicylates. I have not had very many cases of rheumatic arthritis. They get ten grains of salicylates as soon as I can give it to them. Then I give them quinine, iron and strychnine, open up the bowels, and give them all the water they can possibly drink. I would like to hear the rest of you tell what you have been doing. We let the cases of otitis media burst. I haven't had many cases of mastoid abscess. I don't think I have had a mastoid abscess all winter long and I have had a lot of gathered ears. I use argyrol, or iodine and glycerine to paint the throats as a local antiseptic measure.

DR. R. BISHOP CANFIELD: During the epidemic of throat infection which we had in the Hospital last winter, all the nurses wanted to come to the Otology Department to be treated and get well. They weren't satisfied with the treatment that they were getting on the Medical side. This made Dr. Schmidt feel slighted and he asked me what I was giving and I said, "Salol and phenacetin." He said that was what he was giving. I give phenacetin to make them feel well, but the salol is to improve their condition. I give five grains of phenacetin and five to ten grains of salol every two hours until six doses have been taken. Then I stop the phenacetin but I keep up the salol. They get well in three days. On the Medical Service they were giving them equal amounts of phenacetin and salol and it took them three weeks to get well.

DR. WM. BLAIR: I have been giving quinine along with the phenacetin, eight grains of phenacetin and one grain of quinine.

DR. S. M. YUTZY: I should like to ask Dr. Cummings if he was able to see any difference in the streptococcus in the different classes of sore throats which he had. In the epidemic in Chicago many years ago Davis said that he could differentiate a particular streptococcus.

DR. HOWARD H. CUMMINGS: We were not able to look into a throat and say, "This is a streptococcus mucosus throat and this is a hemolytic streptococcus throat." In the last three years we have found this hemolytic streptococcus in the different forms in 80 to 90 per cent. of the cases. Every once in a while we get viridans which produce a little green pigment. We sometimes get streptococcus mucosus, but always in with it we get the smaller hemolytic streptococcus, and I believe that is the organism which has been doing the work in the complications. I don't know that we have ever demonstrated viridans in any chronic case.

DR. YUTZY: Erysipelas was mentioned following tonsillitis. I have a patient who had quite a severe infection of the nose about a week before the erysipelas started and with no sore throat so far as I could make out. He got well from his nose infection and about a week after that he was taken with a severe attack of facial erysipelas. I don't know whether there was any connection between the infection of the nose and the erysipelas. It followed so close that it seems that there might have been some relation.

DR. MAX PEET: I was interested in one case which Dr. Cummings had. The nurse said that the boy rested on the elbow which became later infected. It became sore and tender and it is in that elbow where the streptococcus started in. This was a purely streptococcic infection of olecranon bursa.

Last Saturday I operated upon a baby with an enormous streptococcic abscess on both sides of the spine. It didn't pass across the spine in any way whatever. I could not with a probe make out where it got down. I should say that this child had a retroperitoneal abscess which perforated under the latissimus dorsi on both sides of the spinal column. The whole family had had sore throats. The child had it last. The mother said an abscess burst in the throat. As a result the baby got this big streptococcic abscess.

DR. NELLIS B. FOSTER: This paper of Dr. Cummings is most instructive. It calls attention to some of the little things which amount to large things. There really is a basis for preventive medicine and that is what we are all striving for at the present time. The importance of these so-called minor infections has not, I think, been realized until the last two or three years. It has been borne upon me in studying rheumatic fever, the almost invariability with which one gets a history of tonsillitis if one takes the trouble to inquire into it carefully. As Dr. Cummings has correctly said, these things

are regarded by the laity as of minor importance. In a great majority of cases they don't result seriously. So when an individual has a sore throat and gets over it, the complication which arises in the next month perhaps, seems a new disease. The two occurrences are not associated. The same is also true of all other complications which Dr. Cummings has mentioned, notably nephritis. We have known for a long time that acute nephritis following tonsillitis is relatively a common thing, and yet it has taken years to bear it in upon us that the subacute or early chronic nephritis is very frequently associated with a focus of infection somewhere in the respiratory tract.

I do not think I need to discuss this matter of respiratory infections further excepting to commend Dr. Cummings' work upon the subject. I think it is most useful. It is the kind of work that we must fall back upon ultimately for active measures in preventive medicine.

Dr. Howard H. Cummings: If I should tell you just how I feel about these acute infections and their relations pathologically in the nose and throat, I am sure you would say I am in league with Dr. Canfield. The longer I stay in the Health Service work the more I am impressed with the pathology of the nose and throat. I cannot agree with him that all the infectious diseases get in through this way, but when he says all the lymphatic channels, I think he has covered the mode of entrance of all the infectious diseases.

He made mention of the relation of tonsillitis to appendicitis. If one of your patients gets an attack of appendicitis following closely on an acute tonsillitis, it is my opinion that that patient should be watched very carefully and not operated unless absolutely necessary. I have only had two fatal cases. We have about forty students operated each year for appendicitis. These case are in no way related to throat infections. Two cases have occurred within two days after tonsillitis. They have been operated and both died promptly of streptococcic peritonitis, and Dr. Warthin stated that he found streptococci in the serous coating of the appendix.

As to Dr. Blair's remark about the strawberry tongue and the atypical course that these cases run, Dr. Kieffer, who has had a wide experience with scarlet fever, says there is no such thing as a strawberry tongue in scarlet fever. If you have it, it comes late. He says the typical scarlet fever tongue is a pearly gray tongue. Later on the red papillae come through the gray base, then the strawberry tongue develops. He says not to wait for strawberry tongue to diagnose the condition.

I don't believe that any one can diagnose a streptococcic sore throat with a scarlatiniform rash from a case of scarlet fever. We have to treat these cases as scarlet fever, however, and they must be so handled.

As to placarding for contagious diseases, I would say that the influence on the patient is very marked when you put up a sign reading scarlet fever. If you put up a sign, Measles, or German Measles, you are liable to come back and find that the patient has gone to the movies. If he has scarlet fever he will stay in.

Dr. Lillie has mentioned nephritis and albuminuria in a series of cases which he observed. Dr. Drury of the Health Service staff is working out the frequency of albuminuria in streptococcic cases at the present time. I believe that during the first two or three weeks albumin will be found sometimes following the streptococcic infections. Nephritis comes on from three to five weeks after the streptococcic throat or scarlet fever infection. We are prejudiced about one symptom of nephritis. I have always laughed at backache in nephritis. I believe I have assumed such an attitude because of the newspaper patent medicine advertisement. I have always examined the boy's urine when he would come in with a backache but I thought it was something else. I must say in studying our cases of nephritis that backache is a pretty common symptom. Of course, a lot of it is due to myositis, actual infection of the muscles.

Dr. Hull asked about the treatment. I believe most of us have been doing what he has outlined. In my paper I thought I outlined the treatment of the condition, but if you did nothing more than that, the patient would discharge you. I think rest is the important thing to prevent metastatic processes. I believe that many cases of arthritis would be prevented if patients were not allowed to get up too soon. We have used salol and phenacetin to keep the patient comfortable and we have used salicylates. I believe it is criminal to put highly astringent medcines upon an inflamed pharynx or tonsil. All the bad cases I have seen have followed this treatment You are simply sealing up Nature's avenue of escape for the poisons and bacteria. You coat over the follicles of the tonsil, and instead of the material draining out onto the pharynx, the patient is absorbing all the contents and the bacteria go into the blood and lymph streams rather than over the mucosa. The hot saline gargle is best. It is a physicochemical proposition. I use a half teaspoonful to a glass of hot water. That is a little stronger than normal salt solution. The rationale of the thing is that you are putting a hypertonic solution on one side of a membrane and you mechanically attract poisons from the membrane.

Dr. Yutzy has mentioned erysipelas. This is always mentioned as a complication of streptococcic infections. In his case it followed a nose infection. It is not uncommon. I didn't mention that in our complications, since there are many I omitted. We have had three or four cases of erysipelas. Another thing which we have had is erythema nodosum which has been proven to be a streptococcic infection.

With regard to Dr. Peet's remark about the patient's resting on his right elbow, three of our cases developed arthritis in the right elbow. It is a well known fact that if a boy has had a broken ankle or broken bone, that joint or bone will develop an arthritis or osteomyelitis. Former traumatism offers a place of deposit for these septic organisms

INDICATIONS AND CONTRAINDICATIONS IN THE TREATMENT OF HARE LIP AND CLEFT PALATE.

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Though the subject of the operative treatment of hare lip and cleft palate has been under discussion for some time, there still remain many considerations in the care of these cases which are not yet settled. The best age at which to operate is still a point under discussion, and though this question is in large part settled in the minds of the most experienced workers in this field, it is still undecided by the general practitioners who are first consulted for advice in the treatment of these unfortunate malformations. Just as it is necessary to advise intervention at the proper age, so is it necessary to know the contraindications to successful treatment. Furthermore, should the operator be concerned with the routine treatment in simple and in special cases and complications? To the end that the profession may be reminded of what can be done in these malformations, when and how best accomplished, I offer the following discussion.

In deciding upon the proper age for operation, we find ourselves involved in an old controversy. The earlier workers in this field hesitated in advising any intervention in very young infants. The risk was considered too great, the field of operation too small. A considerable difference of opinion existed, also, as to the proper order of procedure in repairing cleft of the hard and soft palate and hare lip. Some preferred to repair the lip first believing the palate closed considerably after this operation. Others wished to unite the palate first to secure the maximum space for the field of operation. These points have gradually fallen out of the direct line of debate in view of the more important problem of age for surgical intervention and its subsequent risk to the patient.

The believers in operation during early infancy do so on the following grounds: First, these babies are usually very difficult to feed. They nurse poorly if at all at the breast. Some even can not nurse with a bottle. They require special care. They are of weakened vitality, subject to pneumonias, toxemias and malnutrition. As these babies are given a chance to breathe and take nourishment normally, in such proportion do they gain weight and health. In addition to this vital consideration is the ease with which the cartilaginous structure of the maxillae are moulded in early infancy. Lips repaired at this time heal beautifully. There is sufficient exposure for good technic on the part of the operator. There is a minimum of shock due to the incomplete development of the nervous mechanism in the child. Lastly, early repair predisposes to development of normal speech.

The opponents to early operation fear the infant mortality on poorly nourished babies. This argument is weakened in view of the statement that one-half of the children born with extensive clefts of the palate die within a few days after birth. The dangers of postoperative pneumonia is a strong argument. The liability to permanent disfigurement due to too early operation is strongly emphasized. The destruction of tooth buds and repair of clefts in palate and lip when facial contour is so poorly established, leads, they believe to unnecessary facial deformity. Lastly, the speech defects following early operation are believed by some to be greater than when operation is postponed. The logic in this statement is faulty in view of the good muscular development in palates closed early as opposed to the atrophy of disuse in those in which operation has been postponed. Comparative cases must bear witness.

Beyond the questions of when and how to operate we find very little else in the literature. There are, however, certain contraindications to operation which should vitally concern the operator. If he is to gain the best results he must not only bear these in mind but must impress them upon the practitioners from whom he draws his clinic. The hereditary factor as it influences a patient's general health or even his environment must be considered. The patient's own ability at co-operation in the treatment, his intelligence, his personal hygiene—all are to be reckoned with in a successful result. The local condition of the ear, nose and mouth is not emphasized. Among writers on the subject, Brophy has taken most careful pains to call attention to these points. Carmody also makes slight mention of them. Others seem to focus their attention almost solely on operative method.

Another thing of which we find little mention in the literature is the postoperative care. This has been considered mostly as generalities. Practically no attempt is recorded to determine a means of diet and asepsis which would be especially applicable to the conditions met with in hare lip and cleft palate surgery with its diversity of operative methods. Brophy alone

gives detailed description for postoperative care. His chief routine consists in gastric lavage to prevent vomiting and a regular use of boric acid or normal saline sprays. Argyrol and iodine are used to some extent as local applications. Other treatment is largely symptomatic.

In the 66 cases of hare lip and cleft palate treated in the University of Michigan Hospital Clinic in the last fifteen months, the conditions under which treatment was undertaken were most varied. The age variation was one week to thirty-two years. This number includes patients from a wide diversity of social conditions. The physical and mental condition varied accordingly. Among the infants many forms of physical defect, malnutrition and disease were met. Heredosyphilitics and rachitic children, uncared for and ill nourished, were common. Babies from good homes where hygiene and careful nursing prevailed were in the minority. Between the ages of three and twelve nearly the same types were seen with the added factor of speech. Here a troublesome complication frequently arose in those children who from lack of careful training in obedience proved inveterate talkers to the detriment of success. From the nature of the clinic as a state institution and refuge of last resort, a rather large proportion of cases were seen in which more or less unsatisfactory attempts at repair had been tried elsewhere.

The choice of time for operation does not materially differ from that recognized by the majority of oral surgeons today. In cleft of the hard palate, operation is advised as soon as possible after birth. If hare lip exists, repair may be done any time not less than five days following wiring of the hard palate, but preferably in early infancy. Repair of cleft of the soft palate is not attempted before the eighteenth month or before the child would normally begin to talk. This time is chosen to allow the patient to learn phonation as nearly as possible under normal conditions, that is, with a complete palate, and on the other hand to afford the surgeon the better risk of operating on a case old enough to bear well the strain of a general anesthetic. This age also furnishes a much better development of tissue with which to effect a closure of the cleft, than in younger infants. Cases appearing for operation beyond these ages are advised according to their general condition to stand an operation. These rules apply only in uncomplicated cases—cases which lack other marked physical defect and are free from constitutional or local disease.

The preparation of the patient is very simple. A simple enema is given the morning of operation, with the last feeding at six a. m. Atropin suphate, gr. 1/300, is given by hyperdermic just preceding operation, to all babies over three months of age. This preparation seems entirely adequate in clean cases but we have found it advisable in the large majority when the patients entered the Hospital with any suspicion of a coryza, to institute further measures which will be described later. These latter we have come to use almost routinely in all cases.

I do not intend to discuss operative method except in so far as it affects postoperative treatment. Selected horse hair is used exclusively for coaptation sutures as it is productive of less irritation and infection. The local preparation of the field is done by swabbing the palate or lip with tincture of iodine. Argyrol is applied to the suture line before the patient leaves the operating room. Anesthesia is usually obtained by ether with the Fillebrown method. This is necessarily in the hands of an expert with these young patients and a state of analgesia is preferably maintained. This allows of such ready recovery that should excessive hemorrhage or mucus be encountered, the patient can be allowed to swallow rather than aspirate. A constant suction aspirating outfit is invaluable in these cases and saves much worry over aspiration pneumonias as well as saving time for the operator.

The postoperative care consists in a special diet and means for antisepsis in the mouth. In infants, feedings are given every two hours and started within two hours after return from operation. The formula given before operation is modified to a two hour schedule. Feedings are given by sterile rubber bulb. Other patients are on a two hour schedule. All nourishment is liquid and the quantity and caloric requirements are arranged according to the patient's needs. Cuffs are placed over the elbows to prevent the child from getting his fingers into the mouth. The mouth and nose are sprayed twice a day with 20 per cent. argyrol and every two hours with alphazone, after feedings. Spraying is accomplished with an atomizer. The nurse is cautioned not to use swabs or other appliances in the mouth. This routine is maintained following all hare lip and cleft palate operations. Silver wires in the hard palate remain thirty days. Sutures are left in the soft palate 11-14 days, in the lip 6-10 days. Patients are strictly confined to bed except adult cases and rigid contagious precautions exercised over their

rooms. Fresh air is encouraged. Special nurses have charge of these cases with not to exceed four patients to a nurse.

Such measures as outlined above suffice for an uncomplicated case. But unfortunately such cases are scarcely the rule in oral surgery. Therefore, certain special measures must be used to meet the emergency of complicating conditions. Of course the general physical condition of the patient is taken into account and careful examination is made of heart and lungs. Intestinal conditions are not always so obvious nor so readily met. When patients can be detained in the Hospital several days or more before operation, such conditions can be diagnosed and usually eliminated. The most serious complicating factor to successful cleft palate work, however, comes from local pathology in the ear, nose and throat. And this is too often seen. Interference in the surgical result from these sources is luckily not so common in the earlier operation for cleft of the hard palate and hare lip. Before any operation each patient is carefully examined and if serious complicating pathology is present it is removed first. If not serious, the patient is allowed to leave such treatment of these conditions until a later date. Preparatory to operation upon the soft palate, care in this regard is imperative. First of all, the patient must be observed for the possible "cold" which is so frequently contracted when coming to the Hospital. All patients are referred to the Department of Otolaryngology for examination and treatment if indicated. In the event of operation upon adenoids and tonsils the cleft palate operation is postponed at least three weeks, for complete recovery. Discharging ears often necessitate a longer period of treatment and it is with utmost trepidation that operation is advised in these chronic ear conditions. In the less serious local infections, the patient is put through a rigid course of preparatory treatment. The nose is irrigated every two hours with a preparation of ½ per cent. zinc chloride in saturated boric acid solution. This is also used as a spray in the mouth in the more severe coryzas. Argyrol is used as a spray twice a day in the mouth. Operation is not attempted until the local inflammation has definitely subsided.

Complications may arise in postoperative care. In a small percentage of cases excess tissue slough or infection takes place. In our experience these cases arise from certain definite causes. Occasionally a case comes to operation with some chronic nasal or middle ear infection which is either so slight as to have missed detection or is very resistant to treatment. The percentage of failures is high in this type. Bad teeth in this clinic have proved a rare complication, as would be expected since the growing tendency to early operation leaves but few adult cases where such conditions are prevalent. In the course of routine examination this must always be taken into account. Postoperative pneumonia may lead to sufficient infection in the nasopharynx to interfere with perfect union. Old scar tissue from former operation is not in itself a serious complication but as it is so often accompanied by local infectious conditions, it may prove disastrous. The very existence of scar tissue is too often a sign of previous operative failure in the presence of infection. Therefore these cases must be most carefully examined before operation. When sutures have loosened they should be removed. No attempt should be made to repair the gap in the presence of infection. Vomiting during the first day or two following operation undoubtedly may cause serious strain upon sutures, but it is a complication very rarely encountered in this clinic. No attempt at routine gastric lavage is made to avoid this sequela.

In the event of postoperative complications arising in the ear, nose or throat, many remedies may be tried. Whereas in this clinic sterile water was formerly used as a spray or irrigation, we have now passed through the stage of normal saline, boric acid solution, hypertonic saline, carbolic and borax solution, and now find zinc chloride in ½ per cent. solution in suitable medium, controls secretions when they become particularly thick and ropy. In extreme cases this is used every two hours as a nasal douche.

One other complication which should not be omitted is that of the persistent talker. The patient must be encouraged and persuaded by every means possible to refrain from talking unnecessarily. We have never resorted to hypnotics to produce the requisite quiet.

Our advice to patients with partial failure of union is to carry out a routine treatment of the cleft with silver nitrate and wait six months before further operation is considered. In complete failures from infective causes, six months is the minimum time to elapse before a second operation, other treatment to be carried out in the interval as indicated.

A summary of cases since Oct., 1915, is as follows:

Total number of cases of cleft palate only	28
Total number of cases of hare lip and cleft palate	33
Total number of cases of hare lip only	5
Total	66

	Successes	Partial Failures	Total Failures
Under 3 Mos.....	4	1	0
Age 3-18 Mos.	13	1	0
18 Mos., 3 Yrs.	15	5	1
4-7 yrs.	5	2	2
8-18 yrs.	9	3	1
Over 18 yrs.	3	1	0
Total	49	13	4
Ear, Nose: Treated..	12	5	2
and Throat: not Pathology: Treated	3	6	1
Total	15	11	3
Other Complications:			
Pneumonia and bronchitis	3	1	0
Talkers	0	0	1
Previous operation.	3	4	1
Gastro-intestinal ...	1	0	0
Persistent thymus ..	0	0	1
Syphilis, etc.	2	1	0
Total	9	6	3

Certain significant facts appear from this summary. In 66 cases there were no deaths. Of the 13 cases in which success was not complete, 11 had ear, nose or throat pathology. Twenty-nine of 66 cases were so affected, only 18 of all other complications. Facts the table does not show are that two failures were on the same patient, that of four partial failures on patients previously operated all had nose or ear infections. One case accounting for two failures was both an inveterate talker and a carrier of chronic ear infection. One failure had both an enlarged thymus and chronic otitis media. Partial failures include everything from a sloughed suture in the ala of the nose, or a hole in the soft palate the diameter of a match to a considerable cleft remaining in the soft palate. These results were recorded at the time of discharge in each case. The age of the patient is not an important factor in determining the immediate surgical result in complicated cases except in relation to persistent talkers. Careful early examination and treatment of probable complications are essential to the success of cleft palate operations. Return cases must have special care and treatment before operation is advised. Time spent in this direction is most valuable to the patient.

The results obtained in this clinic though not altogether satisfactory, point definitely to certain growing truths in the care of these malformations. Early operation following closely the Brophy method, has been in every case productive of good results. The immediate health of the patient is remarkably improved. Observations upon patients operated upon by these methods after sufficient lapse of time have shown very satisfactory functional results.

Routine general and local preparation of the patient seems indicated in all these cases over an extended period, judging from the large proportion of complicated cases and the results in these in which such care was not extended. Most careful precautions are necessary in isolating these cases from exposure to the usual hospital infections and contagion. Lastly the nursing standard must be maintained if uniform satisfactory results are to follow. The ideal, not always attained, is a graduate nurse of special training and capability to understand the particular problem in surgical care that is required in this type of case, one who is always interested in the result, and who may be relied upon absolutely to obey orders but who is sufficiently keen to notice any need for individual changes in routine treatment.

I wish to call attention especially to the use of antiseptic sprays and douches as applied especially to cleft palates complicated by profuse nasal discharge. There seems little doubt from our results and those of others that simple mechanical cleansing of the parts is sufficient in clean cases. But the problem changes when during postoperative treatment or before, the patient develops a profuse mucous or mucopurulent discharge. This question concerns the rhinologist equally and many remedies have been offered. In my experience argyrol used as a spray in the mouth or nose is probably no more antiseptic than normal saline. When it is desirable to coat over a clean dry wound with a mild antiseptic, argyrol may find a place. For use in the mouth where secretions are constantly washing it away, little benefit can be expected. In those cases of mouth breathers where its use is attended by drying and caking it seems equally ineffective and even dangerous in coating over a surface which is almost surely infected. The use of hypertonic salt solution in excessive discharge seems to provoke a freer, thinner mucus. When the mucus becomes particularly thick and stringy, saline is not sufficient. We have no reason to expect better results from boric acid solution. This is so slightly antiseptic under these circumstances that it offers little advantage over saline. We have not employed alcohol and boric solution

as recommended by Brophy. Of the more recently advocated antiseptics, only alphazone has been tried, and with considerable success if used in strong enough solution to exhibit a definite astringent action. As a solvent of mucus it is moderately effective. At the present time the most efficacious preparation in our hands has been zinc chloride in ½ per cent. strength. This seems to combine with its definite antiseptic properties sufficient protein precipitant action to relieve the most troublesome nasal discharge. We attribute its action not to solvent power but to astringent effect. This involves protein precipitation in the mucopurulent discharge and excites sufficient local irritation to cause a free thin mucus which readily exhausts the glands. The end result is a clean relatively dry nose and pharynx.

SUMMARY AND CONCLUSIONS.

1. Not sufficient thought has been given to the preparation for operation and the postoperative care in simple and complicated hare lip and cleft palate cases.

2. The profession should encourage early operation for the best result as to mortality and functional result.

3. The operator must insist on complete and careful preoperative examination of the patient.

   (a) To eliminate systemic disease.

   (b) To eliminate local pathology in the ear, nose and throat. (Over one-third of all cases in this series had this complication).

4. Age is not an important factor in the surgical result.

5. Success depends largely on the elimination of complications.

6. A period of observation before operation is desirable and necessary to good results.

7. A routine pre and postoperative treatment is imperative. This may be varied to meet complications with success.

8. Satisfactory means of antisepsis should be determined. Antiseptic astringent solutions have proved quite satisfactory.

9. The postoperative care by nurse and physician in charge plays a large part in the final result.

10. Partial and complete failures at repair require a prolonged period before a second attempt at operation.

I wish to acknowledge my indebtedness to Dr. C. J. Lyons for the privilege and encouragement of research in the material from his clinic.

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DISCUSSION.

DR. CHALMERS J. LYONS: I wish to compliment Dr. Baker upon his very valuable paper. It seems to me that it will be a very valuable contribution to the literature on cleft palate surgery. At the present time, as Dr. Baker has stated, there is very little written upon cleft palate surgery and much of the literature in vogue is not authentic.

There is one thing which I wish to emphasize and that is the best operative age. It seems that it does not make much difference how much we emphasize the best age of operation, we still find men operating for cleft palate who don't take into consideration the age. We get patients here who have been operated upon for cleft of soft palate in early infancy, that is, under twenty months. That is absolutely wrong. At such early ages there is little periosteum developed and we depend upon that for our flaps. Such surgeons have read that cleft palate should be operated upon early and they do it regardless of the condition. From the experience of most of the men doing this work, it is true that we must have these cases in early infancy if the hard palate is involved, for two or three reasons, namely, the maxillary processes can be formed by the thumb and finger and the operation can be done with very little shock to the patient. After the lip is closed the patient must be let alone and returned home until just before the patient begins to talk and then the operation for the closure of the soft palate should be made. There isn't any precedent for the successful operation of the soft palate before eighteen or twenty months and I wish the physicians over the state would understand that

that is the proper age for them to expect to get the best results.

We have found for the past few years that many times we would get small openings after the closure of the clefts and we have been trying to determine why these occurred, sometimes they are not larger than the diameter of a match, and at other times as large as a dime. We have been using a wire splint which has attached to it two lead plates for the purpose of splinting the muscular tissue. Recently we have determined that we could relax the palate sufficiently by two longitudinal incisions bucally to the blood supply of the palate, and our results so far have been very much better than those reported in this paper. We have not done enough yet to state whether that is the technic of choice or not, but I am satisfied that it is much better than attempting to use splints in the mouth allowing food particles to collect and thus causing infection. These longitudinal incisions differ from the old Langenbeck method in that they are made outside of the blood supply. In the old operation we have found that many of the partial failures were due to the lack of blood supply.

DR. HARRY M. MALEJAN: I think Dr. Lyons is to be congratulated upon his modification of the Brophy operation. Since the first of January we have been using this technic and we had fourteen cases of repair of the soft palate, and out of the fourteen cases there were twelve perfect results with normal palates when the patients left the Hospital. Of the two cases which failed, one patient had been operated on three times in a neighboring city and has at the present time an opening about the size of a dime. The second case was not a congenital cleft but a luetic cleft, and it sloughed away. I think there are three points in these operations for cleft palate, first, the preoperative treatment. In all such cases we have the tonsils and adenoids removed. This does away with most of the complications. In all of our last twelve cases we have not had any postoperative temperature. The second important point is the operative technic which Dr. Lyons has described. The third is the postoperative treatment. We have a hard time to get our work done properly because of the frequent changing of the nurses in the Hospital. Many of the staff members have to go and spray the mouths themselves. We use alphazone in 2 per cent. solution every two hours and 10 per cent. argyrol every four hours. This is not enough to cause gastrointestinal symptoms.

Our patients now are ready to leave the Hospital ten to fourteen days after the operation.

CORRELATION OF THE ROENTGENOGRAPHIC AND SURGICAL FINDINGS IN SIXTY-TWO OPERATED CASES.

JAMES G. VANZWALUWENBURG, M.D.

(From the Clinic of Roentgenology, University Hospital, Ann Arbor, Michigan).

Ever since we began the systematic examination of gastrointestinal conditions by the X-ray method we have insisted on conducting our examinations in complete ignorance of the clinical or laboratory findings. There are several reasons for adopting this attitude. We recognize that a previous knowledge of the clinical side of the case must invariably influence the examiner, consciously or unconsciously; either he is liable to confirm the clinical diagnosis or he will assume an attitude of such scrupulous rectitude that he is in danger of "leaning over backwards" with similarly erroneous results. Moreover, we felt that the method is on trial and that, to prove its value, it must show conclusions independently. Incidentally, it left the final judgment in the hands of the clinician, where it properly belongs, putting no strain on the *"entente cordiale"* so necessary for the proper co-operation essential to a new department.

We believe that this principle has been justified, and when we came to cast up the reckoning, made some interesting observations that we believe will be of interest to you, especially since such unexpurgated reports are infrequent in the literature. The resulting "batting average" has been somewhat disappointing, and for our comfort we have added a study of the provisional diagnosis with which the patient reached us.

This series of cases covers a period of time during which 380 odd cases were examined. Of these, 62 were reported to us as operated and the operative findings returned. Undoubtedly a greater number of cases came to laparotomy, but the remainder returned to their home physicians or went elsewhere, and no reports are available. Of these 62 cases several had to be rejected because of incomplete data, incomplete examination, or the discovery of conditions not in the gastrointestinal tract. There remain then 56 cases in which a comparison of surgical and X-ray findings is possible.

These cases are arranged in tabular form. (Table 1). The surgical diagnosis is represented by vertical columns and the X-ray diagnosis follows horizontal lines. Each case has been given a letter or character so that its position in the table could be immediately identified and reference to the records simplified.

Such a classification naturally allows but one diagnosis for each case, and in the case of multiple diagnoses it was necessary to select the most important for tabulation. Moreover, every diagnosis on such a table carries the same weight, whereas the diagnostician speaks with varying degrees of conviction. For our purposes we have distinguished "major" and

"minor" conditions, depending on the probable priority or the relative importance in the production of symptoms. For instance, "adhesions" have always been assigned a minor value where a primary cause for the adhesions could be recognized with any degree of certainty. From our experience it would seem that quite as frequently as not they assume a major rôle in the production of symptoms. Other difficulties constantly arose, and I trust you will pardon my very human weakness when I listed a case in which we had made a diagnosis of "appendicitis" and whom laparotomy disclosed had gallstones and a peptic ulcer in addition, as a case of appendicitis.

On the table, a series of shaded rectangles running from the upper left hand corner diagonally downward and to the right represents an agreement between the surgical and the X-ray diagnosis. In these shaded areas are found 26 out of a total of 56 cases, representing a percentage of about 47 per cent. as entirely correctly diagnosed. In the fourth line, representing the cases in which a diagnosis of "adhesions" was made, but the primary cause of the adhesions could not be determined, are found 12 additional cases. These diagnoses are not incorrect but incomplete, and frequently adequate from the point of view of both the surgeon and the patient, since it led to a perfectly justified exploration. Including these increases the ratio to 38/56, or 67 per cent.

A further necessary classification, was the listing of six cases as "diagnosis impossible," where it was realized that some pathology was present, but no conclusion as to its nature was justified. Inasmuch as this conclusion was of no assistance either to the surgeon or the pa-

TABLE 1.

X-RAY Diagnosis	CONDITIONS FOUND AT OPERATION						
	G—U	D—U	App	Adh	G—B	Car	Neg
Gastric Ulcer	**6**		A			w	
Ducdenal Ulcer		**3**		M Q			
Appendicitis			**H Y d f u x**				
Adhesions	L		**E N Z e q v 4 r**	**W a c n 1 2 7**	**I j y**		
Gallbladder		t	J g	P	**B G h k 8**		
Carcinoma						**K R i m s**	
Diagnosis Impossible			U	o	V	S e	b
Negative			T X 5				
Miscellaneous			p		F		

tient, these must be considered as failures against the X-ray method of examination.

The greatest interest naturally attaches to the "misses," and the causes leading to a failure to reach a correct diagnosis. The detailed study of these 18 cases reveals so many interesting, and, in many ways, extenuating circumstances that I propose to briefly consider each one of them.

Considering the cases of proven gastric ulcer, we find "L" diagnosed "adhesions" by us. Our report reads: "We think we are justified in diagnosing adhesions in the right upper quadrant presumably due to duodenal ulcer, possibly to gastric ulcer." Operation revealed extensive adhesions and a small gastric ulcer.

In the duodenal ulcer column, case "t" was diagnosed "gallbladder disease" principally on the evidence of a shadow in the gallbladder region. Operation revealed a fistula between the gallbladder and duodenum through which barium had found its way into the former, simulating gallstone. A liberal interpretation of the facts might justify our placing this case in the gallbladder column.

The appendicitis column is interesting. In all, 22 patients had their appendices removed "for cause;" only six of these had received the proper diagnosis. Eight additional cases were labeled "adhesions," a diagnosis not incorrect in the light of the operation, and not impossibly the major cause of the symptoms in several cases, but, none-the-less, incomplete.

Case "A" was called "benign obstruction, due to pyloric ulcer." Exploration disclosed the omentum attached to the upper surface of the liver, lying as a strong band across the pylorus and causing obstruction. When this was severed, a mass was felt posterior to the stomach which could not be exposed. A ++++ Wassermann further complicated the picture. The temptation to include this case in the gastric ulcer column is very great.

In the cases "J" and "g" the error of interpreting the shadow of a full gallbladder as indicative of pathology, following the contention of Dr. George of Boston, led us astray. One of these cases also gave a history of an appendectomy three years previously.

Case "r" needs some comment. The diagnosis here was "adhesions;" a perisplenitis with adhesions and infarcts was discovered, and incidentally the appendix removed. The pathologic report is "chronic obliterative appendicitis."

Case "U" led to the report "no diagnosis possible;" "the appendix was found long, congested, nearly snared off at one point; right kidney contracted, thickened, irregular lower pole. Appendectomy. Pathologic report; chronic obliterative appendicitis." "Result, 10 weeks later, some pain over the left kidney; worse at night; otherwise well."

The three cases in which no pathology was indicated by the barium meal have no redeeming features.

"T" had an appendix removed and no other pathology noted at operation; the pathologist reported "fecal concretion, old inflammation." But the autopsy disclosed "Primary carcinoma of the cervix, (medullary), metastases in the retroperitoneal glands, adrenals, kidneys, lungs and bone marrow. Chronic parenchymatous nephritis, chronic diphtheritic cystitis, beginning gangrene. Old fibroid salpingitis."

"X" is quite as disconcerting. The surgical notes read, "A band of omental adhesions extending from the transverse colon to the anterior abdominal wall; freed. Appendix retrocecal in a mass of adhesions, buried and sharply kinked, constricted at center, terminal half congested and swollen; appendectomy." The pathologist says, "Appendix negative." The X-ray report specifically notes the free mobility of the cecum in spite of the adhesions found at operation.

In "5" the appendix was free but obliterating and the draining lymph glands were enlarged. The X-ray examination held no suggestion of functional or morphologic abnormality.

"p" represents a "flight of fancy." We discovered a mass distorting the duodenum and fixing the transverse colon. It proved to be a mass of fat. The indications of a really vicious appendix were entirely overlooked.

"Under "adhesions" are grouped those cases in which no obvious cause or excuse for the occurrence of inflammatory adhesions could be discovered at a thorough exploratory laparotomy. The majority are doubtless of such origin, although developmental bands and folds are well recognized causes of trouble.

Of these "M" and "Q" are very similar. In both duodenal ulcer was diagnosed from the deformity of the duodenal shadow; in both the distortion was due to a band of omental adhesions crossing the stomach and duodenum and attached to the superior surface of the liver. In both cases the findings were so typical of ulcer that a similar error must result from the examination.

"P" was diagnosed "gallbladder disease" on

the evidence of adhesions about the hepatic flexure and some deformity of the antral end of the stomach. The surgical notes cite "adhesions between the gallbladder and the hepatic flexure of the colon, * * * gallbladder normal, * * * Lane's kink, * * * uterus adherent to the anterior abdominal wall." The question might be raised whether the gallbladder could be considered normal under the circumstances.

"o" represents a wide discrepency between the X-ray findings and the amount of the pathology discovered. The upper abdomen was filled with a mass of adhesions binding the stomach, duodenum, and gallbladder together and to the anterior abdominal wall. The X-ray

In the disturbed condition of our knowledge of the X-ray diagnosis of gallbladder disease, the G-B division presents an agreeable surprise. In "V" the displacement and disturbance of a mass in the right upper quadrant was recognized but its nature could not be determined. It proved to be inflammatory and two stones were recovered. In "F" a large hepatic mass was diagnosed which proved to be secondary to an old gallbladder disease.

The carcinoma division is less satisfactory. Malignancy of the stomach is usually conceded to be diagnosed with greater certainty by the X-ray than any other abdominal condition. We succeeded only five times out of eight chances.

TABLE 2.

Medical Diagnosis	CONDITIONS FOUND AT OPERATION					
	G—U	D—U	App	Adh	G - B	CAr
Gastric Ulcer	**6**		A D			l
Ducdenal Ulcer		t **3**	E Z	Q W n 7	j	w
Appendicitis			**U F u v x 45**			
Adhesions			T p r	**a 1 2**		
Gallbladder			J X g	p	**E G V n k 8**	
Carcinoma			e		I y	**DRK m i s z**

notes read, "9 o'clock plates are negative except for a rather curious deformity in the prepyloric region and a poorly filled cap. This looks more like traction deformity than that due to ulcer, from the fact that it is quite smooth in outline and shows a distinct angulation of the axis of the canal. However, there is little evidence to support the idea of traction and adhesions, the motility of the stomach, small bowel, and large gut being normal throughout, the hepatic flexure being easily separated, and there being no distention of the ascendans; nor do we think these findings justify a diagnosis of ulcer. We find a more definite diagnosis impossible."

"w" represents the malignant degeneration of a gastric ulcer in a very young man, and the malignant nature was not recognized. This also is an excusable error.

"S" is a more serious error. A careful review of the fluoroscopic notes and the plates fails to reveal any evidence of neoplasm. "l" was complicated by extensive adhesions about the pylorus, grossly deforming the stomach shadow, in which the characteristic defect of a carcinoma of the fundus was missed. A review of the plates demonstrates the evidence was there but was overlooked.

Finally "b" is interesting as a case reported by us as "diagnosis impossible, virtually nor-

mal." The doubtful appendix was removed because no other pathology was found.

For purposes of comparison, I have prepared a similar table (Table 2) of the "provisional diagnosis" with which these cases reached me as compared with the surgical findings. It is freely admitted that this is eminently unfair to the referring physician, since many of these are based on very hasty and superficial examination, the careful clinical examination being carried on at the same time as the roentgenologic examination. Nevertheless, it will serve to give us a basis for argument. This series is shorter than the previous one because the provisional diagnosis is not always given in the record. In many cases the diagnoses are multiple, and the first diagnosis given has been assumed to be the first choice, although the range is sometimes so great as to suggest there was little choice in the mind of the referring agent.

Although a detailed discussion of this table is not justified by the facts and would take too much time, I wish to call attention to a few outstanding facts that seem to me significant.

Gastric ulcer was found but once; it was diagnosed four times. Twice we were in agreement; in "6," which was correct, and in "A" which was incorrect as has been discussed before. Case "1" is probably a legitimate "miss," the condition probably being primarily an ulcer.

Duodenal ulcer was found twice; and diagnosed ten times. Four of these errors belong in the adhesion column, and two more were so placed by us. "w" is also a legitimate error. These cases demonstrate clearly the similarity of the symptoms and the functional disturbances caused by these two conditions.

Appendicitis was diagnosed seven times out of eighteen, but it was never wrongly diagnosed. The error here is on the side of "conservatism." Curiously the two tables are in agreement in only three cases, two having been referred by the Department of Gynecology; and one by the surgeons; in fact only two correctly diagnosed cases of appendicitis came from the Internist. Neurology has a perfect score, 1/1.

In the matter of adhesions the ratio is somewhat better, three cases out of eight. But each of these three cases had a history of previous laparotomies, and the diagnoses were obvious.

The clinical record on gallbladder disease is distinctly creditable; out of nine cases six were correctly diagnosed. "j" was complicated with rather extensive adhesions, in "I" the surgeons frankly entertained the possibility of malignancy, as the internists opined, while in "y" we have only the simple statement of the surgeon "gallstones." This diagnosis was made four times when other conditions were found.

Practically all the cases of carcinoma were properly classified; the two exceptions, "1," and "w" evidently being cases of "malignant degenerations" of peptic ulcers, and there is much to be said in extenuation of the diagnoses in cases "e," "I," and "y."

In a general way we may sum up the tendencies of the two methods by noting that the clinician is prone to place the lesion too high in the G-I tract, that is, to confuse reflex neuroses with organic conditions, and this is particularly true in the cases of appendicitis and adhesions, while the X-ray method, as conducted here, is likely to fail from insufficient evidence, as well as to go astray after the will-o-the-wisp of some striking feature of very minor import. This, presumably, is a hang-over from the days when the roentgenologist expected to make his diagnoses on purely empirical signs and "complexes."

Where a hollow viscus can be completely filled with an opaque material, we may study its size, shape, position and, to some extent, its function. This, however, is possible only with the stomach, cap and colon. The former may be very satisfactorily studied by this method; the latter is normally so diversified in shape that minor changes in shape representing serious changes in function may entirely escape notice. It is rather remarkable to see the relatively small changes in the contour of the large bowel produced by massive adhesions. The remainder of the G-I tract is not open to this method at best, and we are forced to rely on the observed changes of function, especially that of motility. This is done by watching the progress of the opaque meal at various intervals and comparing the clearance time with the standards established by similar observations on the normal. The abnormalities so observed may profitably be studied in the light of the operative findings.

The normal stomach should be clear of the test barium meal in six hours. If a residue remains after an interval of six hours it is held to be pathologic and an attempt is made to estimate the size of the residue in ounces as a measure of the altered function. The distribution of this finding with reference to the surgical findings is shown in this table.

TABLE 3.

SIX HOUR GASTRIC RESIDUE.

	Ratio	Per cent.
Gastric Ulcer	1/4(?)	25(?)
Duodenal Ulcer	0/3	0
Appendicitis	9/26	34
Adhesions	15/35	42
Gallbladder Disease.....	6/12	50
Carcinoma	9/9	100

It should be noted that these ratios are calculated on the total number of times a given condition occurred. For instance, the total number showing adhesions was 35 of which 15 showed a six hour residue, but there were only 10 cases in which the adhesions were the only pathology found, and only three of these produced a residue. The ratio more properly should read 3/10 or 30 per cent. The revised table reads:

TABLE 4.

SIX HOUR RESIDUE (Major Diagnoses).

	Ratio	Per cent.
Gastric Ulcer	1/2(?)	50(?)
Duodenal Ulcer	0	0
Appendicitis	9/25	36
Adhesions	3/10	30
Gallbladder Disease	6/10	60
Carcinoma	9/9	100

The striking feature of this table is the relative frequency of this gastric finding in conditions not primarily gastric. The same feature is brought out in the observations at longer intervals, as follows:

TABLE 5.

GASTRIC RESIDUE. (Total Number of Cases).

	12 Hr.		24 Hr.	
Gastric Ulcer	1/4(?)		1/4(?)	
Duodenal Ulcer	0		0	
Appendicitis	2/26	8%	1/26	4%
Adhesions	1/35	3%	0	
Gallbladder Disease ..	0		0	
Carcinoma	6/9	66%	?	

The single case of gastric ulcer that appears in each of these tables and shows a high degree of gastric retention properly should be classified as "pyloric ulcer," a condition producing an entirely different X-ray picture and which possibly may show characteristic clinical features.

A gastric residue then occurs in many conditions besides gastric disease; in fact, it is rather noteworthy that, with the exception of carcinoma, gastric residue is the exception, while so high a degree of gastric retention as a 24 hour residue may occur in chronic appendicitis.

According to our standards, the ileum should be cleared in 12 hours. The following table shows the conditions in which such clearance failed:

TABLE 6.

TWELVE HOUR RESIDUE. (Ileal).

	Ratio	Per cent.
Gastric Ulcer	1/2	50
Duodenal Ulcer	1/1(?)	?
Appendicitis	14/25	56
Adhesions	6/10	60
Gallbladder Disease	7/10	70
Carcinoma	3/9(?)	?

This table must be considered in the light of the clearance time of the stomach, since the small bowel can scarcely be expected to clear until a stated time after it has received all of the gastric contents. So the cases of carcinoma should logically be excluded from this table, while the cases of peptic ulcer were associated with such extensive adhesions that, from a functional point of view, this condition was predominant. Practically every case that is left was associated with more or less extensive adhesions, and probably this is the determining condition, for we find ileal residue in 23/35 cases having adhesions of any sort or in 66 per cent. of cases.

Ordinarily the upper small bowel is empty during the later stages of digestion or contains only inconsiderable amounts of opaque material. A definite shadow in the region of the jejunum is pathologic and has been named a "high residue." It does not necessarily depend on a gastric residue. Its incidence is shown in the following table:

TABLE 7.

HIGH RESIDUE.

	Ratio	Per cent.
Gastric Ulcer	0	0
Duodenal Ulcer	0	0
Appendicitis	11/25	44
Adhesions	5/10	50
Gallbladder Disease	3/10	30
Carcinoma	1(?)	?

We consider it significant that no cases of peptic ulcer are included in this table. Just why certain cases should show this sign and others not, is not at all clear. We have supposed that the active inflammatory processes were more apt to show this finding but recently we have seen several cases that seem to contradict this hypothesis.

Another sign of some import is the so-called "secretion zone." This is indicative of a fluid secretion in the resting stomach, (12 hours after a meal) and was at one time considered pathognomonic of peptic ulcer. Its incidence is as follows:

TABLE 8.

SECRETION ZONE.

	Ratio	Per cent.
Gastric Ulcer	1/4	25
Duodenal Ulcer	2/3	66
Appendicitis	2/25	8
Adhesions	0	0
Gallbladder Disease	0	0
Carcinoma	?	?

In the course of this study we have tabulated a number of other signs singly and in combination, and the pattern of the fabric is not yet so clear that it may be appreciated by the casual observer. I will mention only one more because of its clinical interest. Where we have found a definite tenderness in the right iliac fossa, over the appendiceal shadow, we have so noted it in our protocols. The incidence of this finding follows:

TABLE 9.

RIGHT ILIAC TENDERNESS.

	Ratio	Per cent.
Gastric Ulcer	0	0
Duodenal Ulcer	0	0
Appendicitis	6/25	24
Adhesions	1/10	10
Gallbladder Disease	4/10	40
Carcinoma	0	0

These results are rather disconcerting to the clinician, but we can find no error in the observation. Nor is an adequate explanation at hand.

From this rapid survey, it appears that we are far from having any pathognomonic signs in roentgenology, and that the diagnosis must be made by careful correlation of many observations quite as in any other diagnostic method. More significant is the fact that many signs are common to unlike conditions, and if we seek a common cause, we can find none except the ubiquitous adhesion. If we assume that adhesions produce these abnormalities of function, it is quite as logical to assume that they also in part, and not unlikely, in large part, produce the symptoms and complaints. This satisfactorily explains the difficulty of recognizing the conditions clinically. It also explains the change that often occurs (in the character and the severity of the symptoms) with greater chronicity, a principle that is recognized and considered when the clinician attaches the greatest importance to the history of the first attack.

By what mechanism these abnormalities of function are produced, whether by mechanical obstruction, or by reflex neuromuscular and neuroglandular action, is one of the most urgent problems confronting the gastroenterologist of today. That the mechanism is not always the same is indicated by the variation in the combinations and the relative severities of these more easily recognized signs. We know perfectly well that extensive adhesions may exist without symptoms, while, on the other hand, apparently very inadequate adhesions are associated with, (and may be the cause of) serious trouble. What are the factors that determine these relations? Is it the position of the adhesion with relation to the parietal peritoneum? traction on the mesentery, on the omentum, the fixation of the small bowels? interference of either of its movements, peristalsis or with relation to the other abdominal contents? or does it depend on the irritation of an inflammatory process?

These are some of the questions that are suggested by this short series of cases. They are problems that confront us daily. They interest not only the roentgenologist but every one dealing with gastrointestinal conditions. And to us they do not seem impossible of some sort of approximate solution. Unfortunately, with our present organization, it seems beyond the reach of this Department. For, even with the present excellent co-operation with the Department of Surgery, we are conceding several basic assumptions. We have to assume that any anatomic changes found by the surgeon represent in truth the causative pathology, we assume that the pathologist is able to distinguish between those changes that produce trouble and those that do not, e. g., in an appendix, or assume that, when the surgeon corrects what trouble he finds, the trouble will disappear and the patient will be well. This is not said in criticism of any department, but is simply a statement of a criticism that would justly lie against the work represented here irrespective of the number of the cases presented or the thoroughness of the correlation.

Let me illustrate by a specific example not included in the series tabulated. A graduate nurse was referred to me with a vague gastric complaint and a dread of gastric carcinoma. She had about reached the menopause and the referring physician considered all her troubles climacteric. He was very certain that I would find nothing significant. On my part, I found nothing in the least suggestive of any alteration of the digestive function, but did find seven large calcareous gallstones. There was no evidence of functional disturbance from these stones, they had probably been there a number of years, there was plenty of room in her abdomen to carry them without crowding, there

was no history of the usual or unusual episodes of gallbladder disease, nevertheless the surgeon (not in this Hospital) unhesitatingly and with considerable enthusiasm removed them and verified my count. But the patient is no better.

On paper this case is a signal triumph for the Department of Roentgenology. But is it?

Medicine took a long step in advance when it followed its cases into the autopsy room. That may do very well for medicine or neurology but it does not satisfy the surgeon. He is his own pathologist. His value as a surgeon depends largely on his knowledge of gross pathology. And he studies his gross pathology, not with a final and conclusive eye, but from a constructive viewpoint. He is also his own "experimental physiologist" and "vivisectionist." His interest does not end in the operating room, nor with the convalescence of the patient, but can and should go one step farther and follow his patients to their old environments and see what the results of his efforts have been. This the man in a limited private practice can not escape for he sees his result constantly with varying emotions. But in a large reference clinic, this is not always done, and the surgeon loses the opportunity to scrutinize the reasons he had for doing what he did, excellent reasons doubtless, but not necessarily the best reasons. And so he runs the risk of doing the same things for the same reasons, and teaching others the same lines of reasoning to similar dubious conclusions. The conclusions are undoubtedly more often right than wrong, but he is placed in a position of not being able to prove it.

Without a good "follow-up system" we can not escape the force of this criticism.

We have stated some of our problems. We need answers to all of them and to many more that have not been stated. To be sure, we have "hunches" on several of them, they form our stock in trade and serve as the basis of our efforts to interpret our findings, but they rest on too slender evidence to justify their publication in the Transactions of this Society. Our purpose is not to dispose of these questions but to state our position and arouse your interest.

Nor does this summary of 62 cases give a correct idea of the value of the radiographic method of examination. The problems are essentially complex and their various factors can not be expressed in simple terms. And much useful information which does not in itself determine a diagnosis is added to the sum total of our knowledge of the case which can not be expressed in any "table."

We believe our "little bit helps" and that the clinician shares this view is shown by the steady growth of the number of cases referred to us for our opinion.

DISCUSSION.

DR. CYRENUS G. DARLING: The men in the clinical departments should appreciate Dr. VanZwaluwenburg's independent method of diagnosis in spite of his modest claims of success. They would probably compare very favorably with most of the clinical diagnoses if fully written and later tested by operation or postmortem.

In many cases the pathology found at operation is not always clear and not infrequently some of it is overlooked. The difficulties encountered in the study of adhesions are not surprising when one considers the many sources of origin and the possible deformities they may cause to the alimentary tract.

Any peritoneal inflammation may be followed by adhesions whether it arises from injury to the abdominal wall from without or an approaching perforation from within the abdominal organs.

The omentum in its protective capacity, attaches itself wherever needed and frequently remains at its post of duty long after the necessity has passed. Such an attachment may cause deformity of the stomach or any part of the alimentary tract by bands crossing the hepatic flexure of the colon. It may form a partial obstruction retarding the onward flow of the barium mixture and suggest the incompetent iliocecal valve.

The old appendicitis may have spread along the cecum to the underside of the liver making adhesions along the way which have remained while the appendix has recovered and assumed its normal form, provided the omentum did not take part in its protection.

Adhesions following operation are usually associated with the abdominal incision and omentum or gut involved to change the X-ray picture. Possibly these may retard the flow of the barium or even suggest an obstruction.

Probably no diseased organ in the abdomen presents such variations in size as the gallbladder and many of those cases giving the most pain and trouble are small and contracted, containing but one or few stones. These are deep under the liver and may also be covered by an inflamed mass of omentum as a protective agent. The single stone which frequently gives the best clinical history would be poor for X-ray diagnosis, again, a large full gallbladder may, by pressure, distort the position of surrounding organs, thus interfering with a correct X-ray reading.

The doctor appears best in his diagnosis of stomach and appendix changes because he has devoted more time to the study of these organs and they represent the beginning of a large percentage of the pathology of the abdomen. Beyond this, much of the pathology will be problematic unless the clinical history is carefully considered to give one direction.

I am sure that a further comparison of plates and findings will lead to greater accuracy in diagnosis both to the clinician and the roentgenologist.

DR. NELLIS B. FOSTER: A paper of this kind is of great use; it is a kind of clearing house that we all need now and then. It may show us up perhaps a little embarrassingly, but I am sure everyone working in a hospital gets an idea now and then that he is pretty good and to find out his real average is very good for him.

The diagnosis between gastric ulcer, gallstones and chronic appendicitis is one which every surgeon and internist of any experience recognizes as one that may be extremely difficult. It may not be always possible to say which one of those three is present. Further than the most careful examination, careful history and X-ray plates, we are not able to go. There is a certain element of satisfaction to be gotten out of the result which Dr. VanZwaluwenburg has shown us that may not appear on the surface. Only one case appeared as needing operation that should not have been operated upon. Granting that all of these cases of adhesions were benefited by operation, then all of the patients should have been either operated upon for therapeutic purposes or should have been explored with the idea of finding out if something could be done to help them. The thing which has puzzled me most since I have been in this clinic is the question of adhesions, and I am glad to know that it is bothering other people. Chronic appendicitis, as I see it here, is a new thing to me. I have been in the habit of going into the operating room and seeing my patients operated upon in the East. Cases with the extensive adhesions of the kinds that we see here are entirely new to me. Occasionally we did see such conditions following operation, but a majority of the cases which we see here have not been operated upon and we do not know the origin of the extensive peritonitis. It is one of the greatest difficulties to me to differentiate a chronic appendicitis, from these cases of adhesions. Probably they are primarily appendicitis with adhesions secondarily, as Dr. Darling has mentioned.

It is not surprising if one thinks of it, the difficulties which the X-ray Department finds in localizing pathologic processes. We know the number of conditions which can give rise to hyperacidity and we know that it is usually due simply to changes in motility in the stomach or reflex spasm in the pylorus—which is another way of saying a disturbance in the motility. Secretory changes are signs which we do not consider pathognomonic; not even in carcinoma. When you study the motor function upon which roentgenologists must depend principally for their interpretation, one meets with exactly the same nervous reflexes which one meets with in the secretory disturbances. So that the difficulties are easily understood. How to overcome them, however, is another thing. I think that probably in the course of time we shall be able to make much more accurate diagnoses upon these cases than we do at the present time, by better methods both in clinical medicine and in the use of the X-ray. The most important condition perhaps from the point of view of its immediate recognition, that of carcinoma, seems to have been better recognized than most of the other conditions, and we shall get what grain of comfort we can out of that.

I think we are all very much indebted to Dr. Van Zwaluwenburg for his very frank exposition of this subject.

REPORT OF A CASE OF TYPHOID SPINE.

WILLIAM H. GORDON, M.D.

House Physician, University Hospital, Ann Arbor, Michigan.

I report this case because it is one of the unusual complications of typhoid fever.

The patient, C. M., male, aged 21, American, single, sophomore literary student in the University of Michigan entered the University Hospital as an out-patient, December, 1916, with the complaint of pain in the lumbar region. This pain was so severe that he could not stand erect, and it was accentuated by the slightest movement.

The patient's father died of Bright's disease with cardiac complications. His mother died at 52, of Bright's disease. Four brothers and two sisters are living and in good health.

The patient has had the usual children's diseases with good recoveries. Since 1903 he has enjoyed good health. He denies lues and Neisser infection. He is a moderate drinker and uses tobacco.

The present illness began with an attack of typhoid fever August 24th, 1916. At this time the patient had a sick headache, which became worse daily. On the 29th he had pains in the abdomen which were not localized, diarrhea, and loss of appetite. He noticed that he had a fever on September 1st, and came to the University Hospital. At this time an examination revealed a much distended abdomen, seven to eight typical rose spots, palpable spleen but no enlarged glands. The Widal was positive with a 1-40 dilution in forty-five minutes. There

was a leucopenia of 6000, a temperature of 102 degrees and a positive diazo reaction on the urine. The patient was entered in the Contagious Ward of the University Hospital and was there from September 2nd to October 6th, 1916. During his stay he had the findings of a typical mild case of typhoid fever. The temperature reached its maximum at 104.0 degrees. After September 15th it never went over 100 degrees. At times during his illness he complained of pain in the lower lumbar region.

Upon his discharge from the Hospital, October 6th, the patient entered his second year as a student in the Literary College of the University of Michigan and proceeded to carry the regular work which is preliminary to the Freshman year in Medicine. At the same time he became careless in regard to himself and did too much outside work, supporting himself by playing at dances three to four hours twice a week.

About October 27th, he began to have pains in the right inguinal region. They were localized behind the anterior superior spine of the ileum, were deep seated and at the onset did not radiate in any direction. Gradually they became more severe and radiated around to the back at about the level of the third lumbar vertebra. About November 15th he had an abdominal examination; at that time the abdomen was everywhere soft, no muscle spasm was detected, and no tumor could be palpated. Over an area the size of the hand and localized about one-half way between the umbilicus and the anterior spine of the right ileum, there was tenderness, which was made more evident by flexing the flexed right lower extremity over the abdomen, and then extending the lower leg. The patient gave a history of having been constipated for a few days, and although the signs and symptoms of a typical case of appendicitis were not present he was directed to remain under observation for a few days and report any changes. From this time on the condition became worse. The patient says that the pain became more severe and at the same time he developed a stiffness of the back. He became weak and was unable to lift anything. Upon assuming the erect posture he had to support his back by pressure with his hand over the lumbar region and until he had fully straightened himself he would have severe pains in the lower spine, which at times radiated around the lower back and abdomen and down the back of the leg. This condition became worse day by day and finally the whole back seemed to be sore especially on the right side. Also the pain, which at first was present only upon movement, became constant. He says he could not stand erect, that his body would lean forward and to the right, also that when he walked he had to make sure that he had each foot firmly upon the ground before taking another step.

Examination of the patient December 11th shows a marked limitation of all motion from the 7th cervical vertebra to the sacrum. All the motions of the spine are associated with marked pain, and upon palpation of the spine there is marked tenderness in the lumbar region over the 2nd to 5th lumbar vertebrae. The patient is unable to stand erect. His body is bent forward from the hip and a little to the right. Upon walking he places each foot carefully upon the floor before proceeding. He says that any jar causes great pain in the back. Upon questioning he says that he has had a marked constipation, which at times was replaced by diarrhea and vomiting.

X-ray examination shows a marked osteogenetic proliferation of the right side of the bodies of the 3rd and 4th lumbar vertebrae, the intervertebral disc being primarily involved. A plaster dressing was applied to the back and the patient was sent home December 20th, 1916, and told to remain quiet, live on a forced diet and put himself under his family physician's care. While at home the patient developed an attack of acute enteritis with vomiting, diarrhea, abdominal pain, slight delirium and a temperature which reached 104.2 degrees. Upon removal of the plaster dressing the temperature returned to normal and the symptoms ceased. From this time, early in January, 1917, the patient remained quiet and as a result he improved so much that he entered the University again for the second semester in February. At this time the pain in the back had almost completely disappeared, there being very little limitation of movement. At the present time there is no deformity to be seen, no limitation of motion, and pain is elicited only upon exaggerated movement of the spine. There are no intestinal or abdominal symptoms.

The diagnosis of typhoid spine is made upon the following findings:

(1) History of a mild illness with typhoid fever. During this illness the patient complained of pains in the lumbar region.

(2) Symptoms of pain in the abdomen two months after convalescence from typhoid fever. These pains became more severe and finally became localized in the spine and especially in the 3rd and 4th lumbar vertebrae.

(3) Marked limitation of motion of the spine.

(4) Posture upon standing was that of the body bent forward upon the sacrum. Attitude upon walking was one of preventing any jar to the spine.

(5) The progressive character of the spinal disease which ceased and became retrogressive upon treatment.

(6) The X-ray findings were those of an osteogenetic proliferation and primary involvement of the intervertebral disc which is a characteristic picture of the condition found after typhoid and other fevers.

(7) The very short time required for the condition to respond to treatment.

The only other condition to be considered in this case is tuberculosis of the spine, or Pott's disease. This disease is ruled out by (1), (6) and (7).

I wish to thank Drs. Washburne, VanZwaluwenburg and Watton for the use of their finding in reporting this case.

DISCUSSION.

DR. HAROLD DEB. BARSS: This case illustrates clearly the need of careful routine examinations. When the patient first came to the Hospital for this spinal trouble, all his symptoms were referred to the front of the abdomen. We have found ourselves liable on a number of occasions to make a mistake believing that we were dealing with an abdominal condition, where primarily the disease is within the spine. Pressure upon the spinal roots will cause pain in the terminations of the spinal nerves and therefore we try to make the routine examination considering especially the spine in conditions of abdominal pain, because we have found ourselves on other occasions almost making an error. I think the diagnosis in this case is correct. Sometimes the diagnosis between Pott's disease and acute typhoid spine is almost impossible. Fortunately the treatment of the two conditions is the same and if one clears up readily under treatment we should believe that we are dealing with a typhoid spine rather than an acute Pott's. Fortunately deformity seldom takes place under treatment. I don't know the ultimate condition of the spine and I would like to see a radiogram of the spine after all the symptoms have disappeared.

DR. JAMES G. VANZWALUWENBURG: This is a rather unusual radiogram for typhoid spine. In this case we were fortunate in being able to make the diagnosis of typhoid spine on the radiogram. As a general rule typhoid conditions of the bones are sharply localized and tend to an osteoplastic ulcer rather than an osteoclastic change, reconstructive rather than destructive. In the hard bones, such as the long bones, we may find small sharply localized abscesses which are fairly typical of typhoid fever. There is no other condition so sharply localized. Typhoid spine commonly involves the body of the centrum and is usually unilateral. This is unusual in that it involves the intervertebral disc. The osteoplastic changes are very well shown. I also should like to see by what process this pathology heals, whether by formation of a bony splint on the outside, or a return to the original condition.

DR. ROBERT H. BAKER: There is probably no other spondylitis other than tuberculosis which can come on with such acute onset as typhoid spine. In the history of this case we find that the patient one month after discharge from the Hospital developed symptoms which might have been interpreted as appendicitis. One month following that the X-ray was able to demonstrate very definite proliferation along the transverse processes which must have shown more or less calcification within the two months following his typhoid. It seems unlikely that any process could develop osseous formation within that time and be absorbed as typhoid spine is supposed to do. Osler classifies typhoid spine under three heads. One opinion is that it is almost entirely a neuropathic condition in which the symptoms are entirely neurotic, the clinical signs of fixation of the spine being almost totally absent. There is a second form in which the X-ray findings are almost negative and yet clinically temperature, nausea and vomiting are present. The final class which is probably a further stage of the second, presents definite spinal changes demonstrable by the X-ray. To me it seems unlikely that the spine which shows such widespread fixation and such local findings could be due entirely to typhoid. To me the X-ray findings of this patient at the time of his convalescence from typhoid would be much more interesting than those of the present date. I would like to know if he had any pathology of the spine to begin with.

DR. CYRENUS G. DARLING: I would like to ask Dr. Gordon if he considered the attack which the patient had at home as a possible second attack of typhoid fever.

DR. WILLIAM H. GORDON: This condition of acute enteritis which occurred after he went home I consider was a recurrence of his typhoid fever. I think that the patients who have the diagnosis of typhoid spine made should wear the jackets much longer than this jacket was worn, but when they get away from the doctor who is treating them it is sometimes impossible to have this treatment carried out.

I think we should consider many of the cases of acute abdominal pain which come in with the diagnosis of appendicitis, as conditions of the spine. I have found in the House Physician's Office that I have diagnosed appendicitis very often and the diagnosis has been changed to spondylitis, as a result of scarlet fever, typhoid fever or some other acute infection.

TRANSACTIONS

OF THE

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Stated Meeting, June 6, 1917

The President, CARL D. CAMP, M.D., in the Chair
Reported by REUBEN PETERSON, M.D., Secretary

MEDIEVAL CARE OF THE INSANE IN MODERN TIMES. "THE COUNTY CARE SYSTEM."

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Introduction.—I know that the physicians who are members of this Society will permit me to use false names of persons and of places in this paper. The things to be described should prove of sufficient interest; the locality is insignificant, especially when it is known by those who have gone into this matter extensively that similar conditions to those here described have been found elsewhere under similar circumstances. To you and to others with similar education and environment may never come the opportunity to know first hand of the care of the insane under the county care system in rural districts. You are accustomed to think that in 1917 the insane of the community are warmly and comfortably sheltered and clothed, well fed, according to their health and needs and given scientifically modern medical and nursing attention, all with reasonable economy in large suitable institutions.

Historical.—There is not room nor proper place in this paper to go into the history of the care of the insane. But briefly, it may be mentioned that in ancient times the insane were regarded as bedeviled and were killed or treated worse than criminals; in medieval times, they were permitted to live but locked up under frightful and horrible conditions, and only in the last two hundred years in Europe and in the Americas have they been treated as sick persons. Now it is rather generally recognized that the insane are sick and that they have certain rights and that they must have specialized medical and nursing attention. An insane person is helpless because of his mental incompetency, and humanitarianism demands that society care for him. When society deprives an insane person of his liberty and of his last slight chance to help himself, then society is in duty bound to provide for him adequately as his needs require. It is inhuman to refuse to provide for the insane. It is unfair to the individual for society to protect itself by incarcerating the insane and then, because of selfishness or shiftlessness, to avoid affording to the insane every bit of scientific custody and care now known within the meager range of human knowledge. And the burden of maintaining the insane rightly falls upon society because in the majority of cases of insanity, society has permitted the existence of the causative factors of insanity in such matters as licensed manufacture and consumption of alcohol for taxes, in the tolerated social evil, in the absence of adequate regulation of marriage with its train of the evil effects of bad heredity, in the selfishness of social conditions where the individual with latent or apparent weakness must assume overwhelming burdens in the struggle for existence, in the rush of modern life leading to early old age, and in the perpetuation of preventable diseases, such as typhoid, which affect the mental as well as the physical health.

Local Conditions in General.—Where society as one large group such as each sovereign state in the United States shirks the burden of the care of the insane, then smaller groups such as the county and the family must assume the inescapable burden but with questionable success. But to the smaller group, such as the county, this burden is unwelcome. The community saves itself in two ways; first, by in-

carcerating the insane and second, by reducing expenses to the minimum which will maintain life. These methods sacrifice the individuals who are insane; they are thus denied the things which are their right and which society should give them. Many of the states in America have a double system; one or more large state hospitals for the insane, which, however, are too small to admit all the insane in the state, and some sort of provision in the county poor farms for most of the rest of the insane in custody, supplemented by private sanitaria, by makeshift accommodations in the jails, by farming out the insane with the paupers to the lowest annual bidders, by releasing the insane on bond to their relatives and by other means. Of course there are many undiagnosed insane at liberty. In dealing with these problems, one should bear in mind the almost similar problems of the feebleminded and of the epileptic, problems usually solved less well. Now let it be said to the credit of the keepers of the county jails and the keepers of the county poor farms that they realize their own incompetency and the lack of local facilities for the proper care of the insane sent to them, and they would gladly have the insane portion of their population removed from their institutions and transferred to the state hospitals for the insane. Many of the other county officials who are not in daily contact with the insane, such as the members of the county court, and many of the state officials such as the members of the legislature seem to express slight interest in the insane and then only from the point of view of local economy of maintenance.

It has often been said that the greatest advantage of keeping the insane and feebleminded in their own counties rather than in large state institutions is that they are more frequently visited by their relatives. But are they visited or are they neglected by their kin? In almost 1,000 cases where this phase was studied, it was found that 60 per cent. had not had one single visitor in the preceding year. Also it is often said that the county care is cheaper in maintenance than the state care. The present and the potential economic status of 558 individuals in thirty county institutions was studied. At present they are practically languishing unoccupied, except that a few do some chores or housework, the total value of which is estimated to be worth about $300 a month. The earning capacity of these same 558 individuals was estimated as if they were in institutions suitable for the care of their respective mental diseases such as large state hospitals with the shops and farm colonies ordinarily found in the better state institutions. Two hundred thirty-one would be helpless, forty-seven would earn their maintenance only, and 270 would earn $2,527 a month above maintenance. The extravagance of the county care is greatly increased by the frequent discharges from residence in the institutions of defectives of child bearing age and by the lack of adequate segregation within the institutions resulting in the increase of the number of defectives who must always be a public burden.

County Care of the Insane in 1917.—The county is forced to assume the responsibility of those of its insane that the state does not admit into its crowded state hospitals. Some of these unfortunate insane are kept in jail for a long or short time, usually from a few weeks to a few months but in some cases for years. In jail they are treated like prisoners, either in solitary cells or mingling with the prisoners who terrify them. Also because of the lack of diagnostic clinics in conjunction with the courts, many undiagnosed insane and feebleminded are sent to jail as criminals because of their antisocial acts, and if these men and women are strong and in good health, they may be sent to the workhouse or sent out on the road in the chain gang. In jail the insane are attended by the jailor or by a "trusty" prisoner, but there is neither matron nor nurse. Where men and women are in the same jail, decency is offended by talk and by actions and illicit relations between sane or insane or feebleminded prisoners through iron-barred doors sometimes occurs and there have been cases where the jailors took advantage of defective women prisoners. There are no means of close watch to prevent suicide of mentally depressed prisoners. There are no facilities for caring for the acutely disturbed insane such as hydrotherapy or facilities for feeding the resistive. In one jail the county physician was giving a man with katatonic excitement ten grains of potassium bromide three times a day; the doctor said that the patient was starving to death and that within his memory three insane prisoners have died in that jail because of lack of proper facilities. Many of the jails are dangerously unsanitary for the sane who can assist in their own care, and therefore their use for the insane is to be deplored. In the jails the insane have no occupation, diversion nor encouragement. In fact, they are only sheltered and fed and no remedial treatment is given them.

At the county poor farms there are many kinds of public dependents such as the insane, feebleminded, epileptic, indigent, sick, senile, infirm and deserted women and children. There are over 400 insane persons in the rural county farms in this region! What care do these insane receive from society and under what conditions of custody are they kept? The insane are not under the care of physicians and nurses especially trained in the care of the insane; in fact they receive only such nursing as the farmer or superintendent and his family can give them, supplemented by the attentions of the other inmates under the intermittent direction of the county physician who comes only when called. No county physician or health officer is trained in psychiatry. No county farm has even one nurse. The kindliness the insane receive depends on whether the superintendent is gentle or abusive, experienced or ignorant, a good husbandman or thriftless. The conditions of custody vary greatly in the different counties. In some places the county has built better buildings than in others and on better farm land and provides more liberally in such matters as food and supplies. There is no one type of county farm, so an outline description of a few will give a general idea of them.

County 1. C. Unfortunately for the healthy interest of the community in its county poor farm, the farm is in a secluded place. It is five miles from the county seat and it is one and a half miles from the pike. There are seven small cabins each having two rooms with accommodations in each room for two inmates. The cabins are unpainted but they are clean and neat and have a long low porch or veranda. In each cabin is a wood stove. One building is of different design and is for the keeping of the insane. During the day the inmates of the farm mix indiscriminately without segregation of sex or of race and they assist in the chores and in the housework. At night there is segregation. However, one feebleminded woman here has a deformed idiot illegitimate daughter born and bred on this farm. The total public expense of maintaining for her whole lifetime this poor unfortunate creature who never should have been born is greater than the expense of providing adequate segregation of the sexes on this farm. One couple here deserve more than passing mention as they were pointed out as an example of romance like a bright spot in the dark. He is an old man who has been here fifteen years. Twelve years ago or three years after his admission, she came here. She is a childish old woman and the diagnosis in her case is the same as in his case, namely, senile dementia. They met here and became engaged and some day he plans to go to town and get the papers so that they can marry. They occupy the same room in the same cabin, and they live apart. He gathers wood for her by day and she cooks for him. But one wonders what may follow this precedent of unmarried men and women living together at the poor farm, and one also wonders what were the precedents of this incident for this couple were not looked on askance. At this farm there is a patient with epilepsy who is not receiving any treatment not even a modified diet. The county health officer had not visited the poor farm in the last quarter of the year. The building set apart for those recognized insane is called the county asylum. It is a one story, octagonally shaped, wooden building with a foundation of stone pillars. In the center is a wood stove and around it are eight cells. The door to each cell is of iron bars and meshes as in a jail. Each cell has a barred window and in each cell is a water toilet seat. In this asylum are kept male and female insane and unless they are violent the cell doors are not locked so that at night they can come nearer to the stove to keep warm. In one cell lying on a mattress bed on the floor with wet bed clothing and with his head resting against the toilet seat for a pillow lay an old man who was paralyzed—diagnosis cerebral arteriosclerosis with softening. The keeper of this asylum is not insane himself; he is a negro inmate with tuberculosis. The inmates receive neither curative nor palliative treatment and have no occupation nor diversion. One of them was asked what he did and he replied that he helped sit around.

County 1. B. Of all of the counties not containing large cities this county has the largest poor farm population and its asylum is reputed to be the best in the rural districts. On the farm are many small cabins and houses and in them are some undiagnosed cases of insanity. The asylum is a new brick and cement and iron building. The county officials who built it are very proud that they spent on it only about three-fourths of the money appropriated, but the lack of equipment causes now and for generations may cause the inmates suffering. The asylum is a long building with a hall way down the center and with six or seven rooms on each side. In the hall are two stoves inside iron cages but the doors of the cages are open. Each room has a small window through the outer

wall, two plastered walls, iron bars as in jail cells for the front wall, no running water, a ledge under the window with a hole in it for a toilet seat, and a bed or a mattress on the floor. There is no privacy of sight, sound, or smell. This building is used for women but at the time of the visit of officials there were about a half a dozen white and negro insane and feebleminded and infirm men loitering in the hall. There is no nurse nor attendant in charge. There are no facilities for bathing. In the wall from the outside there are little holes in which are small graniteware bed chambers which are placed under the toilet seats; some of the negativistic and feebleminded insane do not use these chambers successfully and urine and feces form puddles under the barred but unscreened windows. Some of the beds are but masses of stinking wet, ragged blankets on straw ticks. One noisy katatonic dementia praecox was found in a stenchful wet bed although it was alleged that her bedding was changed every day. Two acutely disturbed patients had recently been returned to county care from the state hospitals as incurable. They were returned because it is cheaper for the county to keep them in this prison than in the state hospital, for here the maintenance is only $45.00 a year, whereas at the state hospital where they might receive intelligent treatment and adequate care the maintenance is $135.00 a year; these two human souls doomed to a life worse than any conception of life after death to save the county $180.00 a year. The county officials are very proud of their economical system of county care. Two acutely insane men are kept in cement floored iron barred cages in a dark, damp barn. The county health officer comes once or twice every three months. Up the hill is the burying ground.

County 2. E. There are several buildings on this farm but no asylum, as the superintendent said there are no insane here. This is a prosperous county, and there is a new building called the infirmary for the physically sick. The infirmary is of brick and wood and is well heated, but there is no running water and the windows are not screened. There is no nurse and there is no way in which modified diets can be prepared for those who are sick with nephritis, tuberculosis or pellagra. In a room with closed windows is a man with acute tuberculosis. One man recently pardoned from the state prison is convalescing from a broken leg. One woman admitted the day before is in an unscreened bed. She has acute pellagra with stomatitis and diarrhea and with severe skin lesions of the hands with secondary infection. The superintendent of this farm is a kindly, bright old man, formerly constable and road supervisor, and among his duties now is the care of the sick. Most of the inmates occupy a long "L" shaped building or home. This is of frame, old, deteriorated, crowded, badly ventilated, and overrun with vermin of several kinds. There are single rooms on both sides of the long hall that runs the length of the building. There is no adequate segregation, and here is found the senile, the senile insane, the feebleminded children, the feebleminded adults, the infirm, and the deserted dependents. The more able inmates try to care for the others. There is no nurse here although every one of the twenty inmates needs constant medical attention. In one room was a woman in bed recovering from influenza and there were three other inmates in her room sitting about the stove. In another room was a demented paralyzed woman, diagnosis, cerebral arteriosclerosis with softenings. She could not move nor talk, but she had been placed in a rocking chair and her wet and stained nightgown was so torn that she was exposed. Beside her was her husband, who takes care of her when he is not gardening. He was an ignorant simple old man with soil stained hands and he could not recall her maiden name, nor when they married. In the door of another room was an old man in wet clothes sitting in a rocking chair under which was a puddle of urine soaking into the rotting, stained floor, a case of postapoplectic dementia unable to take care of himself. In his room were two young men. One was feebleminded and had leg ulcers, the other is normal minded but has both legs paralyzed; the former waits table, and the latter cooks. There was here one family of three generations consisting of five individuals, all feebleminded. In the last room was an idiot woman of 30 to 35 years of age with a mind always like that of a baby of two years. Her father was alcoholic. Over her hands and arms were stockings so she could not bite her fingers. She was in a bed that did not have the raised walls of a crib bed. So that she would not fall out of bed, she was crucified, i. e., each wrist and each ankle was tied to a corner of the bed, and over the bedding were two tight cords, one over the chest and the other lower over the body. She cries all the time. At night she is locked in alone, but every morning she is bathed and the bedding changed by another inmate

woman, a low grade moron. Across from her room are the two bathrooms with bath tubs and running water and beyond these are the dining room and kitchen. In this institution were twenty inmates, three of them insane and five of them feebleminded.

Points of Diagnostic Interest in Psychiatry and in Clinical Medicine.—In practically every county institution there may be found interesting cases of physical or of mental pathology, deserving accurate study and scientific treatment. Of course every case in an institution has a more or less interesting history from the point of view of sociology, but this phase will not be emphasized here. Many of these cases could well be used for clinical instruction if circumstances were favorable.

In certain regions, trachoma is very prevalent and is increasing in frequency. The United States Public Health and Marine Hospital Service has a chain of small hospitals solely for trachoma. Once started in county institutions, trachoma spreads rapidly and unchecked. Typhoid, malaria, and pneumonia are of frequent occurrence at certain seasons. Syphilis is common among the negroes but paresis and tabes are less frequently found than the cerebral endarteritic form with its early hemiplegias. Laboratories and treatment are practically unknown. Hereditary syphilis and degeneracy among the negroes are very difficult to diagnose because of the confusion of the respective stigmata with morphology of a mixed race.

Pellagra in its several forms is often found in county poor farms. Because there is no opportunity for variations in diet, the pellagrins, like the nephritics and the diabetics, etc., languish without the aids now known in medicine.

Among surgical conditions may be mentioned pelvic lacerations, hernia, inoperable and operable carcinomata, all neglected.

Among medical conditions may be also mentioned myxodema, cretinism, infantilism, epileptic burns of many years duration still discharging pus, prostatitis, cystitis, ulcers, hookworm, pernicious anemia, vicarious menstruation, etc. Among the mental diseases cerebral arteriosclerosis, presbyorphrenia, dementia praecox, and feeblemindedness are the most common, but there may also be enumerated manic depressive insanity, paraphrenia, perversions, paresis, alcoholism and morphinism with their sequellae, brain tumor, brain trauma, Friedrich's hereditary ataxia, multiple sclerosis, paralysis agitans.

If I may dare to state this observation without presenting many thoroughly studied cases to prove my point, in the negro with dementia praecox apathy is relatively less frequently found as an end stage, probably because the negro is characteristically rather ebullient in temperament.

Estimates and Relief.—It is estimated that over 10 per cent. of the insane now supported by the public, i. e. about 600 in this particular region, are county charges, and about twice as many feebleminded are in the county poor farms and jails, and that there are about 200 persons who should be in a hospital for the criminal insane, and about 300 epileptics; all these in a state with a population of about 2,300,000. Hence with a system of state hospitals, too small to admit all those needing such care, supplemented by the use of the county institutions, fully 1 per cent. of the entire state are public charges and receive from the public treatment which is a discredit to the public and which is inadequate and frequently inhuman to them. That county care cannot be made satisfactory, is the point of this paper to this audience of physicians. Full state control of the insane with adequate financial support and with the realization that insanity is a community problem is far better and almost satisfactory. Ultimately, it is hoped there will be federal control of the insane and this war with its nation wide control of man power and of industry paves the way for it. With federal control of insanity similar to federal control of immigration, quarantine, etc., the insane of this and of future generations will receive the best of custody and of care in every part of the United States. The immediate needs are better medical training, better national health and knowledge of present conditions. Humanitarianism is more important than local interests. Medicine alone is constructive and universal in spite of war. County care of the insane must now be replaced by full state control.

DISCUSSION.

DR. ALBERT M. BARRETT: The paper of Dr. Hulbert's should be of much interest to us in that it shows the very striking contrasts that exist in the care of the insane in this country. It gives us a present day illustration of conditions which are of historic interest in that our modern methods of caring for the insane have passed through stages fully as distressing as those which Dr. Hulbert has shown here. The encouraging feature is that such conditions are now rare and exist only in those parts of our country which are backward in their social and educational development. I have no doubt but that conditions fully as primitive as those surrounding the care of the insane might be found in

the same communities in other social problems. It is furthermore encouraging to note that there are organizations in this country that are trying to better conditions and the means that they have chosen of bringing to public attention existing conditions must result in lasting improvements. If there is any one thing we must hold to in our attitude towards the insane, it is that insanity and mental abnormalities are medical problems. In communities where this is not recognized, one cannot expect any improvement in conditions.

REPORT OF TWO CASES WHERE THE SYMPTOMS SEEMED TO BE DEPENDENT UPON DISEASE OF THE TEETH.

NELLIS B. FOSTER, M.D.
(From the Medical Clinic, University Hospital, Ann Arbor, Michigan.)

There are certain fashions which creep into medical practice and it is with considerable reluctance on that account that I report these two cases because I am afraid that inferences may be drawn from them. I report them without diagnosis. If you wish to make diagnoses from the evidence, it is your privilege.

The first case is that of a man 31 years old who came into the Hospital on the 29th of August, 1916, complaining of chills and fever. He had daily such violent chills that he shook the bed. Following each chill he would have a temperature rising to 104 degrees and on one occasion 106 degrees. He had had some weeks before he came into the Hospital an acute urethritis. He had at the time he was here a very mild posterior urethritis. On account of his chills and fever, the presence of a slight heart murmur and our inability to find any other cause at the time for his infection, we made a tentative diagnosis of a gonorrheal septicemia. Numerous blood cultures failed to demonstrate this type of septicemia or, in fact, any septicemia. He had a leucocytosis of about 20,000 at the time of each chill and fever. In the afebrile period there was no leucocytosis at all. Because we were unable to substantiate our first diagnosis, we began to seek further evidences of a focus of infection. We were unable to find anything of note in his examination. He was an unusually robust looking man when he first came in here, although he had lost twenty pounds in weight before coming. We were unable to find anything excepting quite a marked degree of pyorrhea and his X-ray picture showed that there were some pus pockets about the teeth. His temperature is of considerable interest because in my experience it is as marked and typical a septic temperature as one sees. (Chart I). It began on the 29th of August and continued until about the 13th of October. On the 12th and 13th of October we began to take out the teeth that were infected with the result that there was very promptly a change in the character of his temperature chart. That is the only thing we did for him.

His fever began to break, and he was discharged from the Hospital on the 30th of October feeling very well indeed. I know his subsequent history for I have seen him within the past month. When he left the Hospital he weighed 136 pounds. He now weighs 180 pounds. He looks and says he is in perfect health.

If you care to draw deductions from the case you are free to do so. I feel rather confident myself that they are warranted, although the evidence in cases of vague infections of this kind is not sufficiently strong to enable us to say that we have proved scientific data.

The second case is that of a woman 35 years old who was sent to the Ophthalmologic Clinic in January of this year by Dr. Abbott of Albion. Her history until just previous to the time she came to the Clinic is not of particular significance. She had had a couple of attacks of bleeding gums and on account of this her physician had advised the extraction of one or two teeth, after which she had bled rather freely. At a subsequent attack of bleeding she felt rather ill but got better without any particular trouble. In December, 1916, she began to feel out of health and noticed that her eyesight was becoming poor. From that time on her eyesight progressively became worse until she was admitted to the Hospital. I first saw her at that time. She had bleeding gums and a bilateral optic neuritis of such a degree that her eyesight was impaired completely. She could distinguish between light and darkness but otherwise had no visual sense whatever. At that time on account of the bleeding gums and the fact that she had a few purpuric spots on various portions of her body, it was suspected that the case was one of purpura, (whatever that may mean). We all wondered if possibly it might be scurvy, but upon questioning her it did not appear that she could have scurvy since she ate preferably an anti-scorbutic diet.

She was transferred from the Ophthalmologic Clinic to the Medical Ward. She bled alarmingly from the gums. In the course of twenty-four hours there was on one occasion a pint of the clots. We gave the various treatments that one would give in endeavoring to stop hemorrhage, serum, etc., without anything but temporary results. She had no fever, nor leucocytosis. The picture was to me a new one and extremely obscure. After a little while she developed some fluid in the right chest and later fluid in the other chest. Inasmuch as it seemed imperative, in order to save her life, that something be done to stop the hemorrhage, for the hemoglobin had gone down to 20, we entertained the idea of removing the teeth. Now this was not done because we thought that the teeth were the cause of the trouble, but as an immediate urgency method of relieving her condition. We could not tell the actual condition of the teeth at that time. A couple of the worst teeth were removed with the result that the woman nearly bled to death. All the methods that any of us could think of failed to control the hemorrhage and when it finally did stop it apparently did so of its own accord. A few days later she developed a pneumonia which was an intercurrent thing and we thought wou'd close the picture.

Chart I

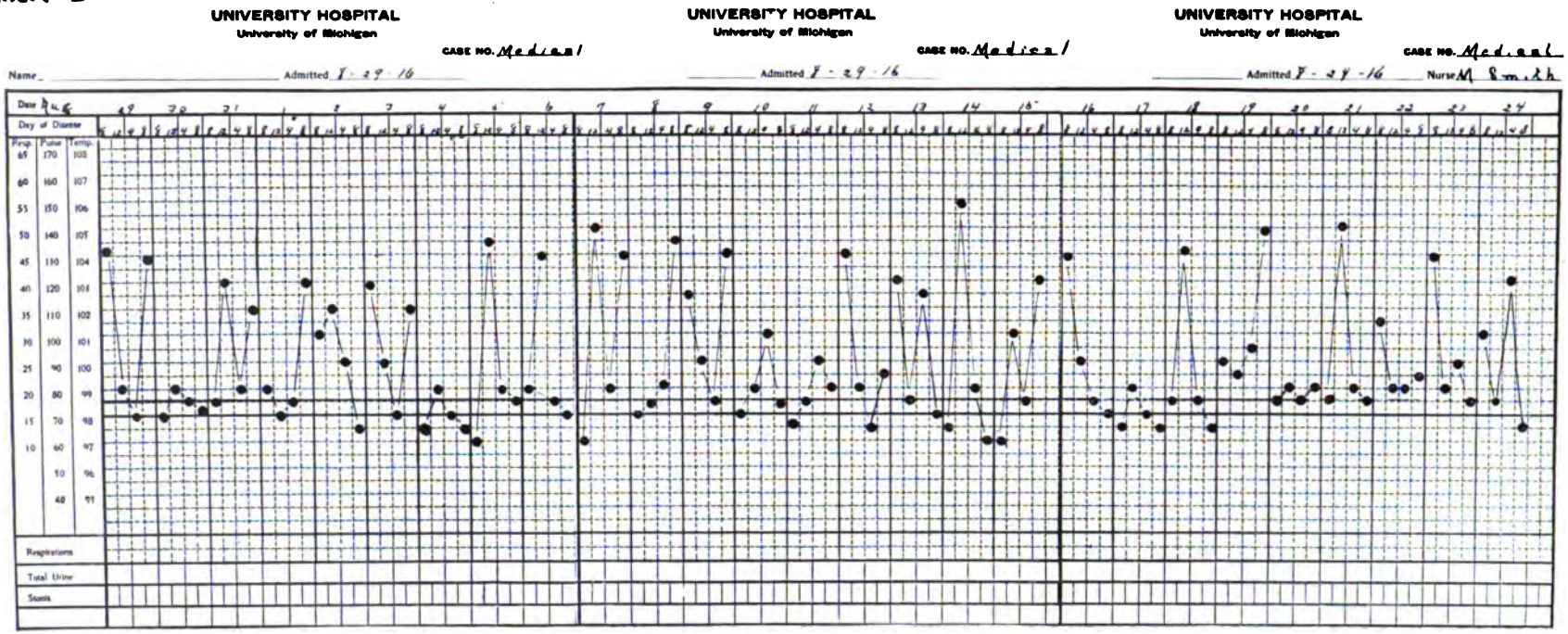

UNIVERSITY HOSPITAL
University of Michigan
CASE NO. Medical
Name
Admitted 7-29-16
UNIVERSITY HOSPITAL
University of Michigan
CASE NO. Medical
Admitted 7-29-16
UNIVERSITY HOSPITAL
University of Michigan
CASE NO. Medical
Admitted 7-29-16
Nurse M Smith
Date
Day of Disease
Resp.
Pulse
Temp.
Respirations
Total Urine
Stools

Chart. II.

UNIVERSITY HOSPITAL
University of Michigan

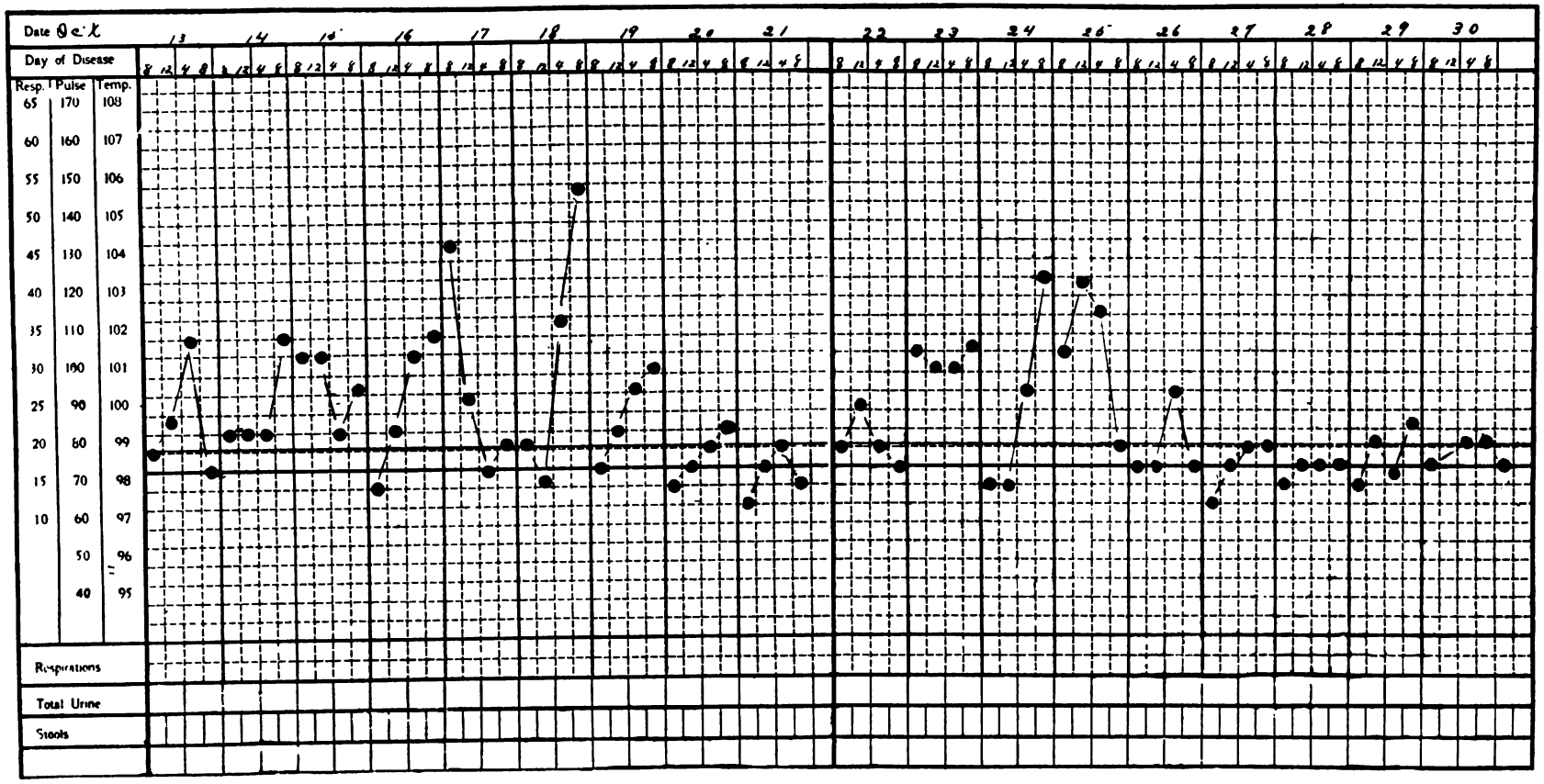
CASE NO. M 8

Name _____ Admitted 8-29-16 Nurse _____

UNIVERSITY HOSPITAL
University of Michigan

CASE NO. Medical

Admitted 8-29-16 Nurse M. Smith



(Chart II). She defervesced promptly on the third or fourth day and continued to improve.

Profiting by our previous experience, we decided that no more teeth could be removed without preparing for it. It was decided by Dr. Lyons that the teeth should be removed. So after that the patient was prepared for each extraction by blood transfusions. Fortunately her husband was a suitable donor and she was transfused from him. When she was prepared, Dr. Lyons extracted two or three teeth at a time. At one time four teeth were extracted. So we got all of the teeth out finally.

Her blood, so far as we could determine was normal. Her bleeding time was normal. Her clotting time was normal. At this time I became interested in certain blood changes which are supposed to be more or less dependent upon infections, that is the reversal of the albumin-globulin proportions. Dr. DeKruif made the determination for us. In animals when there is infection, the ratio of the albumin of the globulin changes so that the blood protein becomes predominantly globulin rather than albumin. That is the condition we found in this patient. The significance of this fact we are not prepared to state, because this reversal is probably found in other than infectious conditions. That is all the scientific evidence we have on the case.

After she had been in the Clinic six weeks or two months, she began very gradually to regain her eyesight. At first there was no apparent change in the optic nerves that one could make out. Dr. Clay examined her repeatedly at short intervals and at the time when she could count fingers Dr. Clay thought that there was no change which could be seen in the retina. Her progress was very slow but constant. Barring the setbacks which she had, her constant trend was toward recovery until for the last two months she has been able to read newspapers but she has abstained from this because she was afraid of eye strain. She has written letters to her family and has read the letters they have written to her. Except for a slight blurring she cannot see that her eyesight has been impaired.

Another very curious thing is that each time the teeth were extracted, fluid returned to the pleural cavity to such degree upon two or three occasions that we did a paracentesis, taking out a liter of fluid. Slowly, as the symptoms subsided following the extraction of the teeth, the fluid would be reabsorbed.

That is the whole story. In my experience I have never seen anything like it. I have gone through the literature and have found nothing like it. One may call it purpura. It is a tendency to bleed. She hasn't hemophilia. In some obscure way there seems to be some association between the general nutritional disturbance, the eye changes and the local condition in the teeth.

DISCUSSION.

Dr. Grady L. Clay: The second case which Dr. Foster reports is one of the most interesting cases which we have seen in the Clinic. At first when she entered we made a diagnosis of bilateral venous thrombosis. That diagnosis was made because she had such marked engorgement of the veins with very little edema of the nerve head, because the physiologic cup was still present and also due to the fact that she had almost sudden loss of vision. But after a few days observing her fundus, it was found that on pressing the eye-ball we were able to empty the veins. This, of course, ruled out double thrombosis. We then decided that it was an unusual case of toxic neuroretinitis. The patient's vision gradually improved after she had had a number of teeth extracted, and when we saw her last before she was discharged, her vision was practically normal, 7½ in each eye, and her visual fields were almost normal. Of course, it is hard to explain this unusual neuroretinitis except on toxic grounds. She had marked hemorrhages with unusual engorgement of the veins. The veins were about twice their normal size while the arteries were small and contracted. She recovered without any scotomata at all.

Dr. James G. VanZwaluwenburg: I should like to ask whether all these teeth were infected, or whether only certain ones of them were, and whether her improvement proceeded pro rata with the number of teeth extracted, or whether she improved more after certain extractions. These teeth infections are generally confined to a few, rarely general, and it seems possible to me that her improvement might have been by stages.

Dr. Carl D. Camp: I would like to say that I had a case in the Neural Clinic which showed an apparent pneumonic condition following the extraction of teeth for pyorrhea. This patient complained of vague pains in various parts of the body and was in the Neural Clinic with the diagnosis of neuritis. Following the extraction of some teeth he developed what Dr. Hewlett diagnosed as pneumonia, but which cleared up in about four or five days. He then had some more teeth extracted and developed another attack of pneumonia. I would like to ask if Dr. Foster has any explanation for the relation between the lung and the teeth.

Dr. Foster: In answer to Dr. VanZwaluwenburg's question, I don't know that our therapeutic measures were well adapted to bring out the stages. The teeth that were most in need of being extracted were the front teeth. On account of the length of time that she had had bleeding before we attempted to do anything, she had of necessity neglected her teeth and had not used a brush and it was Dr. Lyons' opinion that, while perhaps the back teeth were not all bad, they better all be taken out. So we started systematically a routine of building the patient up, infusing her and taking out the teeth. After the first storm we knew what to expect. Her progress was very gradual, hardly perceptible from week to week, but it seemed to be steady from month to month, and it did not seem to be related at all to the extraction of any particular teeth. Of course, the worse teeth were taken first, and perhaps that was all that was necessary. So I don't believe we can answer that question very definitely.

With regard to the attack she had which was called pneumonia, no cultures were made and we are not inclined to be dogmatic. I believe myself that that was a pulmonary infarction because the whole picture is that which would predispose to a pulmonary infarction. We didn't think so at the time but afterwards in discussing the condition, we be-

lieved that it was a pulmonary infarction. The very mildest attack of pneumonia would have carried off a patient in her condition. Pulmonary infarctions do give all the signs of pneumonia and they are transitory. The infarction can be very small but the area of edema and consolidation about the focus may be of a considerable area. The actual fibroid area might be no larger than a cherry, but the signs might be as large as a dollar. I think such conditions are infarctions without a doubt.

REPORT OF TWO CASES OF RETROPERITONEAL HEMATOMA FOLLOWING THE PURSE-STRING WATKINS OPERATION FOR CYSTOCELE.

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The operation of choice in the great majority of women who have reached or passed the menopause and who are suffering from cystocele associated with more or less prolapse, is the Watkins interposition operation.

Briefly, the technic of the operation consists in the separation of the bladder from the anterior vaginal wall, after which it is separated from its attachment to the anterior surface of the uterus and pushed up until the vesicouterine fold of the peritoneum is reached. The peritoneum is then opened and the fundus of the uterus drawn out into the vagina and sutured to the anterior vaginal wall from the fundus back to the cervix.

The edges of the peritoneal opening through which the uterus is drawn adhere quickly around the lower part of the uterus. The bladder in its new position upon the posterior surface of the uterus, in turn is supported by its broad area of attachment to the anterior vaginal wall.

Hence by the one operation, both the prolapse and the cystocele are cured. However, if the patient has not reached the menopause and is still menstruating, the uterine end of the tubes must be cut and buried, since the occurrence of pregnancy after such a radical change in the relation of the parts, would be attended by very serious consequences.

The same condition of partial prolapse and cystocele, but to a lesser degree, is sometimes found in younger women and frequently associated with retroversion. Such patients are still in the childbearing period and do not wish to have their condition relieved at the expense of being sterilized. For such cases, a modification of the Watkins operation, sometimes called the purse-string Watkins, is found to be very satisfactory.

The essentials in the technic of this operation consist in the separation of the bladder from the anterior vaginal wall, after which it is separated from the anterior surface of the uterus and pushed up only about half the distance to the vesicouterine peritoneal fold. A chromic suture is then placed in a circular manner around the under surface of the flaps of the anterior vaginal wall and including the anterior surface of the uterus at the level to which the bladder has been pushed. After this has been drawn up and tied, the excess vaginal mucosa is cut away from the flaps and the edges united from side to side and to the uterus down to the cervix. The operation is then completed by a repair of the perineum and a shortening of the round ligaments if indicated.

By this method the bladder is fastened securely at a higher level and there is no disturbance of the relation of the bladder and the uterus such as would contraindicate further pregnancies. The cystocele is not as likely to recur as in the case of the ordinary anterior colporrhaphy which is done by simply cutting away the redundant vaginal mucosa covering the cystocele, and uniting the edges without pushing up and fastening the bladder at a higher level.

The performance of both the Watkins and the purse-string Watkins is complicated in most cases by very free bleeding from the raw surface of the vaginal and bladder walls, and, as the following cases will show, it is exceedingly important to control securely all bleeding before closing the wound.

In the Watkins operation if there is some persistent oozing which cannot be satisfactorily controlled by hot packs or ligatures, a small cigarette drain properly placed will give free exit to the blood and prevent the formation of a hematoma. In many of the cases the blood probably escapes into the pelvic cavity under the edge of the peritoneal opening through which the uterus is drawn, and is slowly absorbed. However, in case of the purse-string Watkins operation there is no exit above for blood since the upper half of the vesicouterine attachment is still intact and there is no exit below, as this would sacrifice the effectiveness of the purse-string suture. Hence the added importance of thorough control of bleeding in this type of operation.

The postoperative course of these operations is usually uneventful except for a slightly greater degree of fever than usual, due probably to

absorption of free blood and a slight degree of infection of the pelvic peritoneum. There is usually some difficulty in urination for twenty-four to forty-eight hours probably due to the trauma of the bladder and this may necessitate catheterization several times.

Should bleeding continue between the purse-string suture and the lower level of the vesico-uterine attachment, the gradually enlarging hematoma would tend to exert a marked pressure on the base of the bladder and tend to extend around to either side or above the bladder as a retroperitoneal hematoma following the line of the least resistance.

Although this operation has been done frequently in this Clinic it was only recently that the occurrence of two such cases served to call attention to the possibility of such a complication, as will be seen from the following reports.

Mrs. D., age 43 (Gyn. 7586) was transferred from the Medical to the Gynecological Department October 3, 1916. The patient spoke very little English so the history was unsatisfactory. There was nothing of importance in the previous history except the fact that she had ten living children and had come to the Hospital on account of backache and a heavy feeling in her abdomen. Her periods had been regular and normal up to the time of admission to the Hospital. Abdominal examination was negative; vaginal examination showed marked external and internal laceration of the perineum with large cystocele and rectocele, bilateral laceration of the cervix, uterus in retrocession, normal size, freely movable, not prolapsed, and appendages normal.

Under ether, October 6, 1916, the pelvic condition was found to be practically the same, and a dilatation and curettage, purse-string Watkins and perineorrhaphy was done. No more than the average amount of bleeding was encountered and this seemed to be readily controlled. Convalescence was normal except for persistent complaint of pain over the bladder region and inability to void, which required catheterization for the first four days. At the time of discharge from the Hospital on the eighteenth day, examination was negative except for some tenderness over the bladder region. However, no tumor was palpated.

The patient returned to the Clinic four months later, February 20, 1917, complaining of soreness across the lower abdomen, especially over the bladder region. The menses had been normal, the last period occurring February 13th. Abdominal examination revealed an indefinite mass reaching just above the symphysis in the midline and rather deep. Vaginal examination showed the uterus apparently enlarged about the size of a two months' pregnancy but of firm consistency, slightly irregular and quite movable. The appendages were normal.

Examination under ether on February 27, 1917, revealed the same findings, but on opening the abdomen, a round tumor about the size of the fist was seen lying above the uterus in the midline partially covering the bladder and blending rather closely with the outline of the uterus. It was retroperitoneal and easily enucleated from the surrounding adherent peritoneum, uterus and bladder. The cavity was obliterated by sewing the peritoneal flaps back into place. The uterus and appendages were quite normal. Closer examination of the tumor showed it to be an encapsulated mass of semisolid blood clot and microscopic examination showed nothing but blood clot with hyaline walls, areas of blood pigment deposit and numerous phagocytes. Convalescence was entirely normal and the patient's condition has since been much improved.

Mrs. C., age 31, (Gyn. 8213) mother of four living children, came to the Hospital because of headache, nervousness, weakness and a feeling of loss of support. Previous history was negative and the last period occurred April 17, 1917. Abdominal examination was negative. Vaginal examination showed considerable laceration of the perineum, with marked cystocele and rectocele, bilateral laceration of the cervix, uterus in normal position movable and negative and appendages normal. There was only slight tendency to prolapse.

On May 1, 1917, under ether, examination showed the same findings and a dilatation and curettage, purse-string Watkins, and perineorrhaphy were done. There was very free bleeding during the operation and numerous vessels were ligated. For the following six days the patient was unable to void and had to be catheterized. There was great difficulty in passing the catheter and it apparently encountered some obstruction. The patient complained severely of pain across the lower abdomen and on the eighth day following the operation a firm, fixed, and rather tender mass could be felt arising from the pelvis and extending about four finger breadths above the pubes in the midline and above Poupart's ligament half way to the right anterior superior spine and about two finger breadths to the left of the midline. The patient was able to sit up and walk at the usual time although at the time of discharge from the Hospital on the fourteenth day, she still complained of pain across the lower abdomen and some difficulty in urination. Examination showed the incision well healed, but the pelvic organs could not be satisfactorily outlined on account of the mass present which had not decreased in size.

A letter was received from the patient two weeks later, stating that she still had painful and difficult urination and pain across the lower abdomen. She was advised to return for examination and removal of the mass which undoubtedly was the cause of her trouble. The symptoms and findings indicated very definitely the existence of a large retroperitoneal hematoma and if the patient returns for the operation the mass will undoubtedly be found to be of this nature.

Such a hematoma could probably be readily removed by the extraperitoneal route but the advantages of better inspection, more thorough removal and restoration of the parts to their normal relations make the abdominal route preferable. To attempt removal by the vaginal route would favor recurrence of the original deformity.

In conclusion, it cannot be too strongly emphasized that the prevention of a retroperitoneal hematoma following a Watkins or purse-string

Watkins operations lies in the most thorough control of bleeding and, in case of doubt, it is much safer to insert a drain.

Note.—Several weeks after reporting this case, a letter was received from Dr. Ernest K. Cullen of Detroit, Mich., stating that he had just operated upon this patient and on opening the abdomen had found a hematoma about 10 cm. in diameter behind the peritoneum between the bladder and the uterus. The tumor had extended outwards between the layers of the broad ligaments and had also dissected up the peritoneum half way to the top of the fundus. The blood clot was cleaned out and the cavity closed and drained.

DISCUSSION.

DR. REUBEN PETERSON: I haven't much to add. The doctor has brought out the danger in this type of operation. One is apt to be a little careless or hasty in stopping hemorrhage in these vaginal operations, and yet there is a real danger of postoperative oozing which may cause what has been described. I have had one hemorrhage following the removal of an ovarian cyst where the hematoma was retroperitoneal and the blood was let out by an incision extraperitoneally above the bladder. Caution should be used to see that absolutely all hemorrhage is stopped. One is apt to get too far over the side in the region of the big veins, and in spite of apparent hemostasis, there is liable to be subsequent oozing, followed by the condition described in this paper.

LATE RESULTS IN SPLENECTOMY.

QUINTER O. GILBERT, M.D.

(From the Medical Clinic, University Hospital, Ann Arbor, Mich.)

During the last four years splenectomy has been performed many times in this country chiefly on patients suffering from the various forms of hemolytic anemia. This has been especially true in pernicious anemia. The careful study of the postoperative histories tells us the value of the operation as a clinical procedure in the various forms of blood diseases. Of special value is the study of the changes which occur in the blood, because these observations have and are throwing additional light on the role and function of the spleen.

A year ago I reported some observations on the blood of two patients from the Medical Clinic, who had had their spleens removed by Dr. Darling. Recently we have had the opportunity to study again the blood of these patients. It is our intention at this time to speak of these changes and the results of splenectomy in these patients.

Patient I (15-1508) had been sick since December, 1914, his symptoms being those relating to his anemia. There had been two remissions in his condition up to the time of the splenectomy in February, 1916.

The clinical results obtained in these cases are in accord with those reported by other observers. Balfour (2) says that when extensive cirrhosis has occurred in splenic anemia of the Banti type the best results are not to be obtained, although splenectomy early in this type of disease is curative. In general the more chronic the disease has become, the less favorably will the patient react.

Krumbhaar (3) in a statistical study finds that, as a rule, the improvement following splenectomy in pernicious anemia is not permanent. Patients who have been operated upon before the disease is well advanced have done better. If the spleen is much enlarged the chances are better; the same is true of the prognosis if the patient is over 50 years of age. There is some reason to believe that splenectomized patients, in pernicious anemia, react better to blood transfusions and the converse holds true, that those persons who react better to blood transfusions, show the most marked improvement following splenectomy. This points to the condition and reaction of the hematopoletic system in the government of which the spleen seems to have some function.

As before stated, splenectomy is curative in early Banti's disease before excessive cirrhosis has occurred. In congenital hemolytic jaundice the experience of numerous observers (4) suggests it as a rational procedure. Griffin (5) has found that with three cases of syphilis of the spleen, where the patient had a severe anemia, which was not improved by antisyphiltic treatment, splenectomy was apparently curative.

We are much interested in the blood cell changes, following splenectomy in these two patients, because of the significance these blood changes may have to the function of the spleen. We found, as has been observed by others, a tremendous bone marrow stimulation immediately after operation, as evidenced by the marked leucocytosis, the increased nuclear red forms and increase in the large mononuclear

and transitional groups. We were especially interested in the small nuclear particles (sometimes called Howell-Jolly bodies) more particularly their formation, character, source and significance. They are of interest only in that their presence in large numbers is definitely associated with the absence of the splenic function.

Now one year later we find the differential count very much the same, except for the increase in the lymphocytes and the marked increase in the number of nucleated red cells. The actual number of nuclear particles has remained about the same. One would think then that there must be a more essential factor in the blood cell destruction than the spleen. It would seem that the spleen has a very definite relation to bone marrow cell production, and as we previously concluded, it has a most definite relation to the maturing of the red cells, especially in the destructive metabolism of the nucleus of the red cells.

The evidence that the spleen plays a part in hematogenesis is more or less indirect. It seems however a reasonable conclusion from the evidence at hand that the blood cell changes are due to either (1) the removal of the spleen as a hemalytic organ or (2) that a normal inhibitor to bone marrow cell activity has been removed, thereby giving the apparent result of stimulation or (3) that, as the study of the nuclear particles suggests, the spleen exerts a rather than a quantitative effect in the qualitative production of the red blood cells. There seems to be a special function that the spleen has in the denuclearization of the young red blood cells.

It should be remembered that splenectomy was advised primarily with the hope of breaking or removing the principle factor in the hemolytic chain.

In these two patients who have returned to us after a definite remission we have now much greater evidence of hemolysis than before. The spleens were removed and both show marked evidence of bone marrow activity with the principal change in the large number of normoblasts with all stages in the formation of nuclear particles.

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DISCUSSION.

DR. NELLIS B. FOSTER: Only one word with regard to splenectomy in these cases. As our experience increases, the indications are becoming more and more definite. In early cases of Banti's disease considerable improvement can be obtained. In the later cases where cirrhosis has been established, not very much can be expected. In pernicious anemia I doubt very much the wisdom back of the furor for splenectomy. More and more such patients are coming back and it appears more and more that all that has been obtained is a remission. The experience with hemolytic jaundice shows that this disease may be cured. There are fifty-eight cases on record now, all of whom are cured or nearly cured. Definitely contraindicated is splenectomy in polycythemia. This has been done a number of times on patients with large spleens.

CLINICAL CASE REPORT: MALARIA.

HENRY S. BARTHOLOMEW, M.D.
LANSING, MICH.

We have had in this vicinity during the past few years a number of cases that may have been malaria, and not infrequently unmistakable cases either probably or possibly imported. The following described case, however, is the first one I have encountered which leaves no room for doubt; it proves the presence of infected anopheles mosquitoes:

The patient, Vernon Shepler, 928 Penna. Ave., Lansing, was born in Michigan seven years ago, and for five years past has not been five miles from the State House.

July 19th, 22d, 24th and 26th he had a severe rigor followed by high fever; on the intervening days he played about as usual.

A blood smear made soon after the chill on the 26th showed the plasmodium vivax in many red cells; typical signet rings were plentiful as well as the other developmental forms of the parasite.

TRANSACTIONS

OF THE

Clinical Society of the University of Michigan

Stated Meeting, July 1, 1917

The President, CARL D. CAMP, M.D., in the Chair
Reported by REUBEN PETERSON, M.D., Secretary

SUDDEN DEATH IN A CASE OF SYPHILITIC AORTITIS.

ALBERT C. FURSTENBERG, M.D.
(From the Clinic of Otolaryngology, University Hospital, Ann Arbor, Michigan).

The patient, Mrs. C., age 29, entered the University Hospital October 18th, 1916. She was assigned to the Department of Internal Medicine, where the following history was obtained: She came to the Hospital on account of shortness of breath and palpitation. In her family history she states that her grandfather and grandmother died suddenly of heart disease and that her mother and sister were both suffering at the present time from cardiac disease. Her personal history was of importance in that she had suffered twice from a severe attack of acute articular rheumatism, the first at the age of 17 and the second at 22. She had been married for seven years with two children living and well. Her first pregnancy terminated in a miscarriage at the end of the third month. Her second child was stillborn. Her present trouble began seven years ago at the age of 22, when she suffered from a severe attack of acute rheumatic fever, confining her to her bed for more than a month. Since this illness she has complained of intermittent attacks of dyspnea and palpitation. Such a seizure compelled her to remain in bed from December, 1915, to April 1st, 1916. Following this attack she enjoyed fairly good health until August, 1916, when she was again seized with palpitation and cardiac distress associated with edema of the feet and ankles. On many occasions the attacks of dyspnea coming on at night compelled her to sleep in a chair. Recently the shortness of breath on exertion had become a more troublesome feature. Since October 10th she had precordial pain, radiating at times into the left arm.

The physical examination was as follows: Frame large, nutrition and musculature good. There was a visible systolic pulsation in the neck. The lungs were negative. Examination of the heart showed the apex beat localized in the fifth, left intercostal space. The mitral first sound was loud and snappy and preceded by a murmur heard only at the apex and not transmitted. A low-pitch, faint blowing, late systolic murmur was heard at the apex and faintly transmitted toward the axilla. In the tricuspid area a soft blowing, diastolic murmur was faintly heard. The second pulmonary sound was accentuated. The radial pulse was regular, forceful but poorly sustained. The tension seemed somewhat increased.

Examination of the urine and blood was negative. The Wassermann on the blood was also negative. The blood pressure on entrance was systolic 110, diastolic 60. Patient was referred to the Department of Roentgenology where a diagnosis from the orthodiagram of aortic insufficiency was made. From the findings in the Medical Clinic a diagnosis of aortic insufficiency was also made.

On October 18th the patient was referred to the Department of Otolaryngology with a question of a tonsillar infection. Here she gave a history similar to the one previously obtained in the Medical Department. She further stated that the cardiac distress was becoming more troublesome and that she often had bright flashes before the eyes and frequent sensations of fainting. She gave a history of repeated attacks of acute articular rheumatism each definitely preceded by tonsillitis and quinsy. Examination of the throat revealed submerged

hypertrophied tonsils with numerous large crypts and extremely septic. Examination further revealed a bilateral cervical adenitis. In view of the definite history of attacks of tonsillitis, followed by rheumatism and the septic nature of the tonsils, it was advised that the patient be transferred for tonsillectomy under cocaine anesthesia, providing the heart condition at present was not a contraindication. She remained on the Medical Ward twelve days prior to the operation under treatment with digitalis. Her temperature and pulse remained normal. She was not confined to her bed and her condition improved rapidly. She made daily visits to the Dental Clinic and at no time during her stay in the Hospital did she suffer from cardiac distress or dyspnea on exertion.

On October 26th she was transferred to the Department of Otolaryngology for operation as advised.

On the following morning the patient was brought to the operating room. She had been given morphine grains 1/8, atropine grains 1/150, hypodermatically one hour before. She complained of no unusual symptoms and showed no signs of fear or apprehension. The operation was performed with the patient in sitting posture. The right tonsil was infiltrated with one and one-half drams of ½ per cent cocaine hydrochloride, in a 1 to 10,000 adrenalin chloride solution. The right tonsil was promptly enucleated without incident and with practically no hemorrhage. The left tonsil was then infiltrated with about one and one-half drams of the same solution. The anterior and posterior pillars were freed and the tonsil dissected down to the base. Suddenly the patient became very pale and covered with a cold, clammy perspiration. The pallor was quickly replaced by a flush of cyanosis, rapidly spreading over the neck and face. The pupils became widely dilated, the muscles of the back and lower extremities became rigid, the radial pulse was imperceptible, and the patient fell forward and promptly succumbed. All means of resuscitation were of no avail. A stethoscope applied to the chest showed that cardiac action had ceased before the cessation of respiration.

Following is the autopsy protocol from the department of pathology:

Congenital syphilis. Diffuse interstitial myocarditis and aortitis. Syphilitic spleen. Aortic insufficiency, and relative insufficiency of mitral valve. Cardiac dilatation.

This case presents a number of interesting points. What are the possibilities? What was the exciting cause of death? Can we say that it was a definite case of cocaine poisoning occurring in an individual with an idiosyncrasy for the drug, or is it a case of acute dilatation accompanying shock? Or might it be due to an anginal attack, or a breaking away of a vegetation on a valve which lodged in one of the cerebral arteries? To me it seems that the anesthetic had nothing to do with it. Knowing that cases of aortic insufficiency are characterized by accidents and surprises, and that sudden manifestations after long periods of latency especially characterize the syphilitic type, I believe that it is reasonable to conclude that any trivial operation or any slight shock might have produced the same result.

DISCUSSION.

DR. HARRY B. SCHMIDT, Detroit: This case is very interesting to me because I just recently saw a case of sudden death after the use of cocaine. The patient had received a less than 1 per cent. cocaine solution injected into the urethra for cystoscopic examination and within five minutes he died from convulsions. The concensus of opinion of pharmacologists is that there is not an idiosyncrasy to cocaine. The sudden deaths are from the rapid absorption of the drug by means of the circulation. In Dr. Furstenberg's case, due to the dilatation of the pupils, I should think that that was a possibility that would have to be considered and it is something that cannot be helped.

I was surprised to hear that the diagnosis of mitral stenosis was made here and not a pure aortic insufficiency with an Austin-Flint murmur. That, I should think, should be considered the first thing. Of course, in all cases of aortic insufficiency lues should be considered.

DR. JAMES G. VAN ZWALUWENBURG: I had the privilege of examining this patient as Dr. Furstenberg has stated, and in going back over the record I think we could have excluded mitral stenosis absolutely on the shape, size and general characteristics of the heart. As a matter of fact it is the one striking situation in which the orthodiagraphic distinction between heart lesions is of most use. We can almost certainly distinguish between mitral stenosis and aortic regurgitation.

The doubtful etiology of lues I think is exceedingly interesting. As a matter of fact, the Wassermann was negative. There was adequate etiology for aortic regurgitation. How was one to suspect that this was a case of congenital lues in the absence of stigmata? As a matter of fact, lues needs to be considered as an etiologic factor in aortic regurgitation only in those who are older. It is a matter of statistics that the majority of cases seen in patients over forty are luetic. The others are mainly due to the tonsils. I cannot see how from the prognostic

point of view, any other course could have been pursued than to remove the tonsils, even though the lues had been determined beforehand. Possibly may be pardoned if I still have a lurking suspicion that the cardiac pathology was due to the tonsils rather than to the lues, although lues may have been present. But it does not seem possible to me that this is a true luetic aortitis.

A CASE OF HYSTERICAL BLINDNESS.

CARL D. CAMP, M.D.

(From the Neurologic Clinic, University Hospital, Ann Arbor, Michigan).

The case which I have to report is one of hysterical blindness of long duration. Hysterical blindness is a condition which is rather rare; in fact, there are some writers upon the subject who are somewhat skeptical about its occurrence. For instance, Sachs, writing in 1899, says that he would "prefer not to accept the occurrence of complete hysterical amaurosis of a month or more duration until more convincing cases are brought forward." Dana says "hysterical amaurosis may last many weeks." Starr says that "cases have been reported to have been complete and bilateral." De Schweinitz says, "I have never examined a patient with hysterical amaurosis except as it occurs in a temporary way during the course of an attack, but some of the cases in the literature appear to me to be above suspicion." Kron divides the cases into those that are transitory, those of short duration and those of long duration. The longest duration of any cases on record is the case reported by Harlan of Philadelphia. His patient was a young man who was struck above the eye and became blind in that eye. He continued to have pain from time to time and was advised to have the eye enucleated. At the Wills Eye Hospital where he went to have the operation, it was found that the blindness was hysterical. There are four cases on record in which hysterical blindness has lasted from five to eight years; four cases where it has lasted about a year and a half; twelve cases lasted from one to eight months; nine cases from two to three weeks; and nineteen cases from one to five days. The cases where it has lasted five years or longer have all been unilateral.

The case that I have to present is that of a young woman, aged 19, who was admitted to the University Hospital on the 25th of May, 1917. She was first admitted to the Ophthalmologic Clinic where the diagnosis was suspected, and was then transferred to this Clinic. Her family history was of no special importance. There was no history of blindness in the family. She had measles and chickenpox; no diphtheria, scarlet fever nor typhoid. She never was troubled with sore throat or headaches. Her menstruation was slightly irregular and began at eleven, before the present trouble began.

She said that when she was about eleven years of age she suddenly became partially blind while studying in school. She could not see to read. The following day she obtained glasses and then she could see as well as before. From then on her vision gradually failed, although she continued to go to school, and a doctor told her that the optic nerve was affected. At that time light hurt her eyes and she had to sit in a dark room. At fourteen she said she became totally blind, and since then has been unable to see and does not even have light perception. She had her tonsils and adenoids removed about three years ago and then entered the School for the Blind at Lansing, Michigan, where she has been ever since. In February of this year she had the grippe and following this general weakness, especially in the knees, and a numb, drawing sensation in the legs. At times the right leg seemed worse than the left. There is no difficulty in urination. The legs felt strained, "as though they were sore." She had had no sharp pains.

Upon examination on her admission to the Hospital it was noted that she was fairly well nourished, but undersized and somewhat infantile in appearance. There were no definitely enlarged glands. The forehead was prominent. There were marked stigmata of deviation. There seemed to be a dropping of both eyelids, especially when she was requested to look upwards. She did not, could not, or would not, look in any direction voluntarily. This was not, however, a paralysis of extraocular movements, since if her eyes were watched it would be seen that they would occasionally turn in complete excursion. The pupils apparently did not react to daylight. They occasionally moved, but the only change was dilatation when the patient had both eyes open. As she had had atrophine in her eyes, the day before, this observation is open to some question. The tongue protruded straight. There was no tremor of the tongue or lips. The teeth were sound. There was no atrophy nor deformity of the arms or hands. The finger nails were severely bitten and the hands had a decidedly infantile appearance. The biceps and triceps jerks were present, equal

and normal. The musculature of the legs was infantile in type. Knee and Achilles jerks were active and equal. There was no ataxia nor incoordination in the fingers. There was no atrophy nor deformity. Plantar irritation caused flexion of the toes on both sides. The nurse from the School for the Blind said she was bright and learned readily. She had taken up the Brill system of reading and writing and had been considered a bright pupil in that respect. For the past six years she had complained of a drawing feeling in the back of her head. In a dark room the pupils show spontaneous variations, dilating and contracting, but it could not be proved that there was a definite reaction to light. The optic nerves were normal, but small. In standing she leaned towards the right. The gait was slightly staggering, but not ataxic. Pressure upon the calves of the legs was painful but pressure on the nerve trunks was not painful. There was no scoliosis nor kyphosis of the spine and no special tenderness.

Several conditions were considered in the diagnosis. One particularly was tabetic amaurosis, a case of juvenile tabes with sudden onset of blindness. Against this diagnosis was the absence of any atrophic change in the optic nerve and the negative neurologic examination. Another diagnosis was the possibility of a tumor at the base of the brain pressing upon both optic tracts. Against this diagnosis was the absence of any change in the optic nerve and the negative X-ray findings. The blood Wassermann was negative. The blood count was normal. The urine was negative. The cerebrospinal fluid showed no increase in cells or albumin and gave a negative Wassermann reaction.

In view of the fact that the patient had normal fundi and normal pupils, but claimed to be completely blind, and also in view of the fact that the patient evidently had an hysterical condition in the legs, the diagnosis of hysterical amaurosis was suggested. The patient was put upon static electric treatments and on the 4th of June, she confessed that she could see. She says that she saw plainly "by flashes," sometimes as plainly as ever, but for the most part it was only lights and objects. She promptly named colors. She did not rotate her eyeballs upon command, though she did so spontaneously. She could read large type. She could place her finger on a definite point. When she tried to read she says it strains her eyes and hurts her head. There was no anesthesia of the conjunctivae.

She has been at the School for the Blind for three years and has learned to read and write by the Brill system, which is quite complicated and the fact that this girl has learned this is a very interesting point and one not hitherto observed in cases of hysterical amaurosis. This morning she was reading the headlines of a newspaper with considerable more rapidity than she reads them this evening. That, of course, is liable to fluctuation. Vision is not completely restored, but I think it will be. The diagnosis is confirmed, and with that diagnosis there is no reason why she will not recover complete vision.

I have had an opportunity of seeing three cases of hysterical amaurosis and they have fallen into the three different classes which Kron has made. A case in which the blindness was merely transitory occurred in a private patient who at the time that she first came to me was suffering from an abdominal complaint which was of hysterical origin. She told me that she had had attacks of transient unilateral blindness accompanied by severe pain over the eye, which had been diagnosed as acute glaucomatous attacks. I had a suspicion that such attacks might be hysterical, and while under my observation she had one of these attacks and I was able to relieve it by suggestion and rubbing the brow with a little camphorated oil. The second case was in a child twelve years of age, brought to the University Hospital. The child showed a unilateral amaurosis. She was diagnosed in the Ophthalmologic Clinic as a case of hysteria and transferred to the Neurologic Clinic where psychotherapy relieved the condition promptly. This present case is one which has had a longer duration for a bilateral amaurosis than almost any case in the literature. It is also unique in the respect that the patient has lived for three years in the School for the Blind without the diagnosis having been suspected. She was not sent to the Hospital with the idea that her blindness might be helped, but because she was developing this peculiar condition in her legs which was also hysterical and which she has also recovered from.

DISCUSSION.

DR. GRADY L. CLAY: What is the prognosis?

DR. CAMP: That depends upon the kind of treatment she receives. If we simply content ourselves with bringing back vision with static electricity and suggestion, I think she would have a second attack. On the other hand, if she be treated by psychoanalysis, I think she may be completely cured.

DR. REUBEN PETERSON: How does she look upon this?

DR. CAMP: She is not especially glad to be well, a condition which we find frequently in hysterical patients. She is a little afraid now that she has recovered her eyesight, that she will not be in the pleasant surroundings of the School for the Blind.

DR. NELLIS B. FOSTER: Have you any clue to a psychic trauma?

DR. CAMP: No.

DR. FOSTER: Have they ever turned a neurologist into a blind institution?

DR. CAMP: I don't believe so. I would not be at all surprised if I had an opportunity to examine five hundred blind, to find perhaps two or three cases of this kind. The cases are not confined to women. Harlan's case of ten years duration occurred in a man and Kron's case was in a man.

DR. MAX PEET: Hasn't she been seeing?

DR. CAMP: It is a psychic blindness and this brings up the question of what you call blindness. One might say such a patient was never really blind. You may say that her visual apparatus has always been intact, but she has not perceived. It is as if a person were walking about with his eyes open, but thinking so intently about something, that he did not see, i. e., failed to perceive what was going on about him.

DR. JAMES G. VAN ZWALUWENBURG: Could you get dissociations similar to the alexias and apraxias in cases of this kind?

DR. CAMP: It is possible, but not quite the same as in a case of organic disease.

DR. PETERSON: Would a person like that react from danger? Would she walk over a precipice, or would she instinctively draw back?

DR. CAMP: I think she would draw back. I think if she were walking in a crowded street she would get past people much better than another blind person. I think she might very well react to danger. There are several peculiar things about her appearance that Dr. Clay and myself noticed on her admission. One was that her eyes did not have that aimless nystagmoid movement of the blind, and at first glance it was recognized that this was a most unusual case of blindness, although she was perfectly certain at that time that she had no light perception.

REPORT OF A CASE OF PREMATURE SEPARATION OF THE PLACENTA COMPLICATING NEPHRITIC TOXEMIA.

LESLIE L. BOTTSFORD, M.D.
(From the Obstetric and Gynecologic Clinic, University Hospital, Ann Arbor, Michigan).

By premature separation we understand the separation before birth of the child of the normally implanted placenta at any time during the last three months of pregnancy. The condition is also called "Ablatio Placentae" by some authors.

The separation may be complete or partial, but in any case hemorrhage results from the tearing of the placental vessels. The blood may be retained as a retroplacental hematoma; may diffuse around between the uterine wall and the placenta and its fetal membranes; may occasionally rupture into the amniotic cavity; or more usually, provided the fetal membranes are separated, it escapes in part through the cervix. In the first three possibilities we are dealing with concealed, or internal hemorrhage, and in the last one with external or combined hemorrhage. This complication is the true accidental hemorrhage of pregnancy in contradistinction to the unavoidable hemorrhage resulting from all types of placenta previa.

Frequency.—Statistics vary as to the frequency of this condition, but in recent years it has been concluded that accidental hemorrhage of different degrees of severity is much more common than the unavoidable hemorrhage of placenta previa. Holmes, of Chicago, in reporting 200 cases claims that one in every 200 labors is of pathologic interest, and that one in 500 labors is of clinical importance from the standpoint of premature separation. The absolutely concealed types are relatively rare. J. Whitridge Williams reports seventeen cases in 2000 labors, in contrast with fourteen cases of previa occurring in the same group at the Hopkins' clinic.

Etiology.—Previous to 1885 when Winter directed attention to the frequent association of nephritis with premature separation, the commonly accepted etiologic factors were trauma of any type, relative or absolute shortness of the cord, or profound mental emotion. Endometritis and placental disease or abnormality have also been thought to play a part. Most authorities of late have reported albuminuria associated with at least 50 per cent of their cases. Williams in his complete paper reports albuminuria in eleven of his seventeen cases. It remained present, however, in the urine in only two cases, postpartum. He summarizes by saying: "As a result of my investigation and study I am prepared to admit that trauma may occasionally be a causative factor; that I know nothing of the effect of mental emotion; that endometritis when present is merely an accidental complication but that there probably exists some indirect connection be-

tween toxemic processes and the accident in question."

Symptomology and Diagnosis.—Symptoms vary a great deal depending upon the amount of blood lost and the general resistance of the patient. Complete concealment of the hemorrhage is very rare, and usually causes the most severe symptoms, as shock and collapse. The amount of external hemorrhage is not necessarily an index of the severity of the case, or of the amount of separation. The pulse may also not change in rate or volume until late. Practically all cases, however, whether of internal, external or combined hemorrhage show a change in the consistency of the uterus which usually becomes ligneous, and tender to palpation, the patient complaining at the same time of constant aching pain over the lower abdomen, accentuated at intervals by sharper, griping or labor-like pains.

Whenever antepartum hemorrhage begins and the finger introduced through the internal os of the cervix cannot demonstrate placental tissue, especially if some of the above enumerated symptoms are present, a diagnosis of premature separation must be made. Consideration, however, must have been given to the possibility of uterine rupture, ectopic pregnancy, cervical lacerations, etc.

Treatment.—Hard and fast rules cannot be laid down. Every case, even of partial separation, will continue to bleed until the uterus empties itself, or is emptied, and is able to contract down upon the bleeding vessels and sinuses. In addition one cannot judge of the severity of the case by the amount of external hemorrhage present.

Treatment, then, depends primarily upon the general condition of the patient, the apparent loss of blood, and whether or not labor is present.

If the case is a mild one, the patient should be carefully watched, quiet obtained and contractions stimulated. According to Holmes between 50 and 75 per cent of this class of cases will deliver themselves spontaneously. Of Williams' seventeen cases, nine terminated spontaneously with good result. Vaginal tamponade sometimes stimulates contractions, and ergot, or pituitrin in small doses may be administered.

Interference should be made upon the first appearance of serious symptoms. If the os is dilated, use forceps, version, or craniotomy. If the os is not dilated, stimulate contractions by the introduction of a rubber bag: complete the dilatation by larger bags, manually, or by Dührssens incisions, if the cervic is effaced. Delivery should then be accomplished in the most conservative manner.

In some cases with rigid or unchanged cervices, or more particularly, with partially or completely concealed hemorrhage, associated with severe symptoms of shock, abdominal Cesarean is the best procedure. In this last group Cesarean is indicated for the reason that the uterine musculature may be to all practical purposes destroyed by bloody infiltrations, a condition referred to as retroplacental apoplexy by Couvelaire. The uterus may fail to contract and fatal hemorrhage ensue following delivery, unless the uterus is removed at once, supravaginally. In fact, all cases are apt to develop postpartum atony and require instant packing for control of hemorrhage.

Most writers now agree that neither vaginal tamponade nor artificial rupture of the membranes are to be recommended, being unnecessary in the mild cases as a rule, and a source of procrastination in the severe cases.

Prognosis.—The prognosis depends upon the severity of the case, the best accompanying the milder cases in which the patients deliver themselves spontaneously. Holmes in reporting 200 cases of all types gives a maternal mortality between 50 and 60 per cent. The fetal mortality irrespective of treatment falls between 70 and 85 per cent.

The following case is reported mainly for its etiologic significance:

Mrs. H., aged 30, entered the Obstetric Clinic, May 31st, 1917. She was advanced seven months in her fifth pregnancy. Her general health during the previous pregnancies had been good. The first and fourth pregnancies terminated at term; the second and third at the fourth month, one following measles, and the other from no explained cause. There was a history of several attacks of acute rheumatic fever ten years before, and she had undergone a laparotomy in 1909, at which time an anterior shortening of the round ligaments was performed. There was no history of preexisting nephritis, hemophilia, lues, or other constitutional diseases. Her menstrual periods had always been very irregular, and scanty, the last flow occurring October 15th, 1916.

During the present pregnancy she had been in good health until April 1st, at which time she developed an attack of bronchitis and cough. Dyspnea appeared, followed shortly by edema. For three weeks prior to coming to the Hospital the dyspnea and generalized edema had been

increasing markedly, and she noticed that she passed decidedly less urine than normally. At times she had had asthmatic attacks and had been unable to sleep while lying down.

Examination.—Examination on entrance showed her to be a patient of short stature, decidedly obese. Her general appearance was good except for marked dyspnea, with some cyanosis of the mucous membranes. Her mental condition was entirely clear. Over both lungs all types of râles were heard. The heart was normal. The abdomen was symmetrically enlarged, the uterus corresponding in size to a normal seven months pregnancy, with the fetus presenting in occiput right anterior, and fetal heart normal. The extremities were intensely edematous from the knees down, the skin being tightly distended and shiny. The blood pressure was 205 mm, systolic, 135 mm, diastolic. The pelvis was of normal size. Vaginal examination showed a multiparous outlet, the cervix was bilaterally torn with canal patulous, and the fetal head presenting. Catheterized specimen of urine showed eleven grams of albumin per liter, with many casts of all types.

The patient was put to bed and brisk elimination started. About 7:30 p. m. while in bed, she complained of sudden abdominal pain. This became more severe and was shortly followed by external hemorrhage of moderate amount which came in gushes. By 9 p. m. the uterus had become distinctly larger, of hard and woody consistency, and very tender on palpation. Neither fetal parts nor movements could be felt, and the fetal heart was not heard. She complained of constant aching pain across the lower abdomen, accentuated at intervals of every few minutes by sharper cramp-like pains which she probably correctly interpreted as labor pains, although no distinct contractions could be made out by reason of the tonicity of the muscle. Following preparation for labor a vaginal examination was made. The cervix was found not as yet effaced and only admitted the finger. No placental tissue was palpated through the internal os.

It was determined to use expectant treatment and allow labor to continue without interference, as the patient's general condition, pulse, respiration and hemoglobin were practically unaltered. At midnight the bleeding was still continuing in moderate amount. Her general condition was the same, and uterine contractions were not improving. Because of her restlessness and anxiety it seemed unwise to attempt the insertion of a rubber bag through the cervix without anesthesia, and the latter was not deemed advisable because of her lung condition. The vagina and cervix were, therefore, firmly tamponed with gauze at this time in the hopes of stimulating uterine contractions. In one and one-half hours the pack was soaked through, but contractions were distinctly better in type, and the patient was apparently in the same general condition. Expectant treatment was, therefore, continued and the external hemorrhage gradually decreased. At 9:45 a. m. she had several hard contractions, expelled the pack, and ruptured the membranes. The fetal head at once began to crown, and at 10 a. m. a premature, stillborn, seven months, male fetus was delivered spontaneously without laceration. The cord was of normal length. Immediately following the fetus considerable old dark blood escaped. The placenta was immediately delivered by the modified Credè method, coming away intact, and with it were several large dark clots, one as large as a fullterm fetal head. The entire surface of the placenta was dark in color and covered with old clot. There were no particular macroscopic abnormalities of the maternal placenta found. The uterus contracted down well and remained in good condition with no bleeding. Ergon, however, was given prophylactically.

The puerperium progressed normally, no bleeding occurring at any time. The patient was allowed out of bed on her ninth day, at which time pelvic examination showed normal involution. The urine, however, failed to clear rapidly even with eliminative treatment and diet. Examination at the time of discharge from the Hospital on her fourteenth day, postpartum, showed about one and one-half grams of albumin per liter and a great number of hyalin and granular casts. The blood pressure had dropped to 145 mm, systolic, the edema had entirely disappeared, and no râles were to be heard over the lungs.

In this case the etiology of the separation seems clearly defined. There were none of the suggested factors present, as trauma, short cord, mental emotion, endometritis, or placental abnormality. Instead, we had a definite case of nephritic toxemia of severe grade terminating as per rule at the seventh month. Even had she not developed premature separation the fetus would have had very little chance for life, by reason of the severity of the toxic state and her stage of pregnancy.

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DISCUSSION.

DR. REUBEN PETERSON: This is one of the severest complications of pregnancy. Fortunately the cases of concealed hemorrhage are not as common as cases where the hemorrhage is external. I haven't the slightest doubt, however, but what many cases of both the concealed and external type are unrecognized. I think that most of us can remember cases of a mild degree where a woman would bleed at the beginning of labor and examination showed that it was not a case of placenta previa, and after the placenta was born you could see where there had been a premature separation. Now it varies from the form where the cases amount to a very little to the severe cases where it is a question whether the life of the mother can be saved, the fetal mortality always being exceedingly high. In a case of this description there is no question about treatment. The conservative form of treatment is the best. If, however, this patient had not responded to the gauze pack, being a multipara, she would have had manual dilatation and an immediate delivery of the fetus and placenta because the only real hope of the mother where there is a severe hemorrhage is immediate delivery.

I have had a number of cases where undoubtedly trauma was the cause of the premature separation. I had one case in a neighboring town which I shall never forget, where a young woman in her second pregnancy about seven months advanced was bumped over a road in an automobile by her husband who delighted in driving fast. When she reached her summer cottage by a lake she began to bleed. They became alarmed and brought her home and I was sent for. She had lost a large amount of blood externally and from her condition there was undoubtedly a good deal of blood in the uterus. The pulse was very feeble and she was extremely pale and shocked. I tried the conservative form of treatment, because she seemed to be so shocked by the blood that had been lost. However, she didn't respond to the packing of the vagina and cervix, and inasmuch as she was losing in strength and the pulse rate was increasing I finally did a manual dilatation and version and delivered quickly. There was an interesting point, by the way, in this case, in that she developed an embolus and had a hemiplegia. She recovered from this and it looked at one time as though she was going to get well, but she later developed a mesenteric thrombus and died.

Where the cervix is rigid and the woman is losing a large amount of blood, and where the condition is critical, I think there is a field for abdominal Cesarean section. I think the vaginal Cesarean section is not indicated for the treatment of this condition. The abdominal Cesarean can be performed and followed by the removal of the uterus. In the serious cases the maternal mortality is high and the fetal mortality is even higher. I think the doctor is to be congratulated upon his success in this case.

DR. CARL D. CAMP: I was very much interested in one statement of Dr. Bottsford that severe emotional shock will cause separation of the placenta. I wonder if that has ever been definitely established. The evidence in favor of emotion causing such a thing I would like to have brought out.

REPORT OF A CASE OF PELLAGRA.

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The case I wish to report is one of pellagra, a condition which is not seen very commonly in this section of the country, but which is becoming more frequent, and is very common in the southern portion of the United States. I will read the history and then present the case with a short discussion.

The patient, female, American, housewife, aged 51, presented herself because of an eruption on the hands. Her family history has no bearing upon the present trouble. Her past history and marital history are entirely negative.

She dates her first symptoms as beginning four weeks ago following an attack of grippe. During her treatment of this condition she states that the doctor gave her muriatic acid, which resulted in a diarrhea, characterized by mucus and bloody stools lasting two weeks. About this same time the patient first noticed a burning sensation in the mouth, especially affecting the tongue. This has lasted up to the present time. About two weeks ago she had her hands in strongly alkaline water for several hours. The following evening she experienced a burning sensation in the hands and the next morning there was a marked erythema over the proximal phalanges of each hand. This erythema has continued to spread up to the present time and has been accompanied by burning. This latter symptom has been absent since the patient's entrance into the Hospital. She states that for the past two years, since the death of her husband, she has been continually

depressed and melancholy. On further questioning the patient gives a history of having eaten practically no meat for the past several years. She does not remember exactly just how long ago but states that she has had no desire for meat for some time. During all these years her diet has consisted practically wholly of potatoes, oatmeal, vegetables, graham crackers, coffee and tea. Lately, the patient states that she has been very nervous, is unable to sleep and feels depressed all the time. Her appetite has been very poor for several weeks and she thinks she has been losing weight for some time.

The patient is a poorly nourished female of average height and average appearance. Over the hands, wrists and forearms, involving only the dorsum of the hands and extending over the flexor surfaces of the wrists, there is a brown-red pigmentation. The border is sharply demarcated, the distribution is symmetrical and gives a glove-like appearance over the hands. There is desquamation over the dorsum of the hands only. The process extends upward to about the junction of the lower and middle third of the forearms. The papillae of the tongue are atrophied and the mouth has a beefy red appearance. When this patient entered the Hospital we were of the opinion that she had quite marked mental symptoms. However, Dr. Barrett has gone over her carefully, and he is of the opinion that her mental symptoms do not amount to much. So far as we have been able to ascertain, she has had only slight gastro-intestinal symptoms.

Pellagra has not been known in this country very long. It was first described by Searcy in Alabama some years ago. Since that time there has been a very widespread distribution of pellagra throughout the south and in many villages and towns three to five per cent. of the inhabitants may be affected. In the village in which I live in Alabama there have been some two or three hundred cases of pellagra. Forty-one per cent. of the negro population affected have died with it, whereas only 12 per cent. of the white population have succumbed.

The etiology of the condition has been a source of worry and interest, and each general practitioner who sees a great many of these cases has a new etiologic factor. In general, we might say that there are two opinions as to the origin of pellagra. One is that it is a metabolic disturbance. The other is that it is an infection. It was held for a long time that pellagra was caused by the ingestion of spoiled corn. However, this theory has never been proven. Goldberg, in Mississippi, has carried out some rather extensive experiments so far as metabolism is concerned and through the courtesy of the Governor of the State, and with the full consent of a number of convicts, he put a certain number of them on diets, some on high carbohydrate diets and a number on high protein diets. The patients whom he put on high carbohydrate diets developed typical skin lesions of pellagra. After the development of the eruption they were placed upon high protein diets and the dermatitis disappeared. Wood and others believe that pellagra is caused by the lack of vitamines and the disease has also been experimentally produced by feeding patients on high carbohydrate diets in which some of the vitamines have been destroyed. In the newer process of milling meal the corn is heated to 120 degrees and some of the fat removed. Wood claims that the essential vitamines are destroyed in this process. He has noticed that the people who live on bolted meal have pellagra and those who do not use bolted meal do not have pellagra. He uses this as an argument in support of the theory that the disease is due to a lack of certain proteins.

For a long time pellagra has been confined to the poorer classes in the south. Recently some of the well-to-do families have had pellagra in their homes where they had the necessary protein intake, but it might be argued that the patients did not care for such proteins.

On the other hand, there are those who believe that pellagra is caused by specific organisms. Sanburn, who has done more than any other man in the study of pellagra, has always held that it was due to a protozoan transmitted by the bite of an insect. A French pathologist says that he has found an organism in all cases which he has examined. This organism goes through definite cycles, as a streptococcus, staphylococcus, etc., and he has also found it in the spinal fluid and in the spleen of patients suffering from the disease. There has been a commission appointed in this country to try to find out the definite etiology of pellagra. The work is carried on by the Rockefeller Institute. I believe they have come to the conclusion that no specific organism can be demonstrated. On the other hand, they have found in pellagrins organisms which are not normally found in the intestine and they believe that they are associated with the condition, but not necessarily the cause. In the epidemic in South Carolina a marked decrease in the number of cases was reported after the proper care of sewage was

instituted. This would speak in favor of the bacterial origin of the condition.

The prognosis in these patients is very bad, as a large percentage of them die. The treatment of the condition is not satisfactory. Due to the fact that it was thought that the condition might be produced by a lack of certain proteins, these patients are fed on a very high protein diet along with arsenic. Arsenic was once believed to be a specific. However, so far a specific drug has not been found.

DISCUSSION.

Dr. Robert Hale: I feel that one should approach the etiology of pellagra with a great deal of caution. The literature on pellagra today is practically worthless. In the south practically every village has two physicians with two different theories as to the etiology. The commission appointed for the study of the etiology of pellagra has not yet decided as to what it is. In my own experience under Professor Houston in the University of Georgia, we were unable to find any definite history of restricted diet. One case might come in which appeared strongly a case of high protein diet. Another would come in giving a history of a high carbohydrate diet. But observation over a number of cases did not bear out the theory of restricted diet. At the time that Dr. Goldberg was doing his work, my fellow interne and myself ran a series of cases. He had twelve cases and I had ten. He treated his cases with a high carbohydrate diet. I used a high protein diet. All the cases received the same medical treatment with alkalinization. He lost two patients, but they were nearly dead when they came in. I lost none. In view of the fact that improvement has been found to result from sanitary measures, I am inclined to lean to the infection theory. It has been shown at the last meeting of the Texas State Medical Association that the incidence of the disease has decreased in the state of Texas due to sanitation. I am quite sure that the sanitary improvements have been important.

As to the mental symptoms, one often hears of a diagnosis of pellagrous insanity. You may have a typical maniac depressive insanity which is offset by the exhaustive state of the disease. You may have a mental confusion or asthenic state. Another type is a mild depression which runs along with the disease, and you meet that with any acute infection and any chronic disease. The most common mental symptom found in pellagra is the toxic delirium.

As to the treatment, as Dr. Elliott has said, there practically is none. In my experience in Georgia the prognosis in the younger cases was not grave. They would recover by hygienic treatment in the hospital, but they returned in a year with the same symptoms.

Dr. Roy A. McGarry: When Dr. Engmann read the report of the work of Dr. Goldberg, he seemed to be quite taken up at the time with the results gained on the high protein diet. He also mentioned some skin involvement which we don't see in books, that is involvement of the scrotum. In a great many of these cases the scrotum was involved by an inflammatory process similar to the condition on the hands. He also spoke of work being done in certain Childrens' Homes there along dietary measures and he spoke of a certain mask-like appearance which these patients have. I would like to ask these men who are more familiar with pellagra whether they know of any involvement of the scrotum, or whether there is anything in the facies in these patients, especially in children, which would lead to a diagnosis.

Dr. Elliott: (Closing the Discussion). In regard to Dr. McGarry's question as to the involvement of the scrotum, practically all the literature deals with pellagra in women, but in practically every description we find that the vulva is quite frequently involved. All of the textbooks make mention of this fact and I don't see why it should not apply to the male genitalia as well as in those of women. Of course, pellagra is much more common in women.

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